Series 1949, No. 10

Issued November 1959

SOIL SURVEY

Lawrence County Alabama

OUR SOIL ★ OUR STRENGTH

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service

HOW TO USE THE SOIL SURVEY REPORT

THIS SURVEY of Lawrence County will help you plan the kind of farming that will protect your soils and provide good yields. It describes the soils; shows their location on a map; and tells what they will do under different kinds of management.

Find your farm on the map

Capability units can also be called management groups of soils. Capability units are grouped into capability classes and subclasses.

Abernathy silt loam, level phase, is in capability unit I-1. Turn to the section Use and Management of Soils and read what is said about soils in this capability unit. You will

Contents

Page Page

SOIL SURVEY OF LAWRENCE COUNTY, ALABAMA[1]

Soils surveyed by HOYT SHERARD, Alabama Department of Agriculture and Industries, in charge, and B. E. YOUNG and H. J. WESSON, Alabama Agricultural Experiment Station

Correlation by MAX J. EDWARDS, United States Department of Agriculture

United States Department of Agriculture, Soil Conservation Service, in cooperation with Alabama Agricultural Experiment Station, Alabama Department of Agriculture and Industries, and Tennessee Valley Authority

compiled from United States Weather Bureau records are given in table 1. Complete climatological records are not available for Lawrence County; consequently, those for Morgan County are used in this report.

Precipitation is distributed fairly evenly throughout the year, but the hazard from runoff and flooding is greater late in winter and early in spring. In winter the soils are moist and generally too wet for tillage. The ground seldom freezes deeper than 1½ or 2 inches, and then only for 2 or 3 days at a time. Light snows are common, but they seldom stay on the ground for more than 3 or 4 days.

Winters are mild enough for fall-sown oats, barley, wheat, and rye, and for winter cover crops, as Austrian peas, vetch, and crimson clover. Small grains and winter cover crops can be grazed during most of the winter, although these plants do not grow well during December, January, and February. The ground may be too wet to be trampled by livestock for several days at a

According to reports from the Weather Bureau at Decatur, the average frost-free season extends from March 28 to November 3. The length of the growing season is 220 days. The latest recorded killing frost is April 26, and the earliest is October 11. Late spring frosts commonly damage strawberries and peaches. Damage to crops by early fall frosts is much less significant, since most crops commonly grown are not subject to frost damage at this time of year.

Crops can be planted from 5 to 10 days earlier in the Tennessee Valley than in the other parts of the county.

Soil moisture is favorable for crops throughout much of the growing season. There is generally enough moisture in spring, but occasional dry periods slow the germination of seeded crops and reduce yields of early crops. During the growing season, there are from one to five dry periods in which crops need additional moisture. These dry periods last from several days to several weeks, but they seldom are severe hardwoods, 5 percent yellow pine, and 5 percent cedar-hardwoods (*6*).[2] The Tennessee Valley Authority cooperated in planting trees on 1,599 acres.

Water Supply

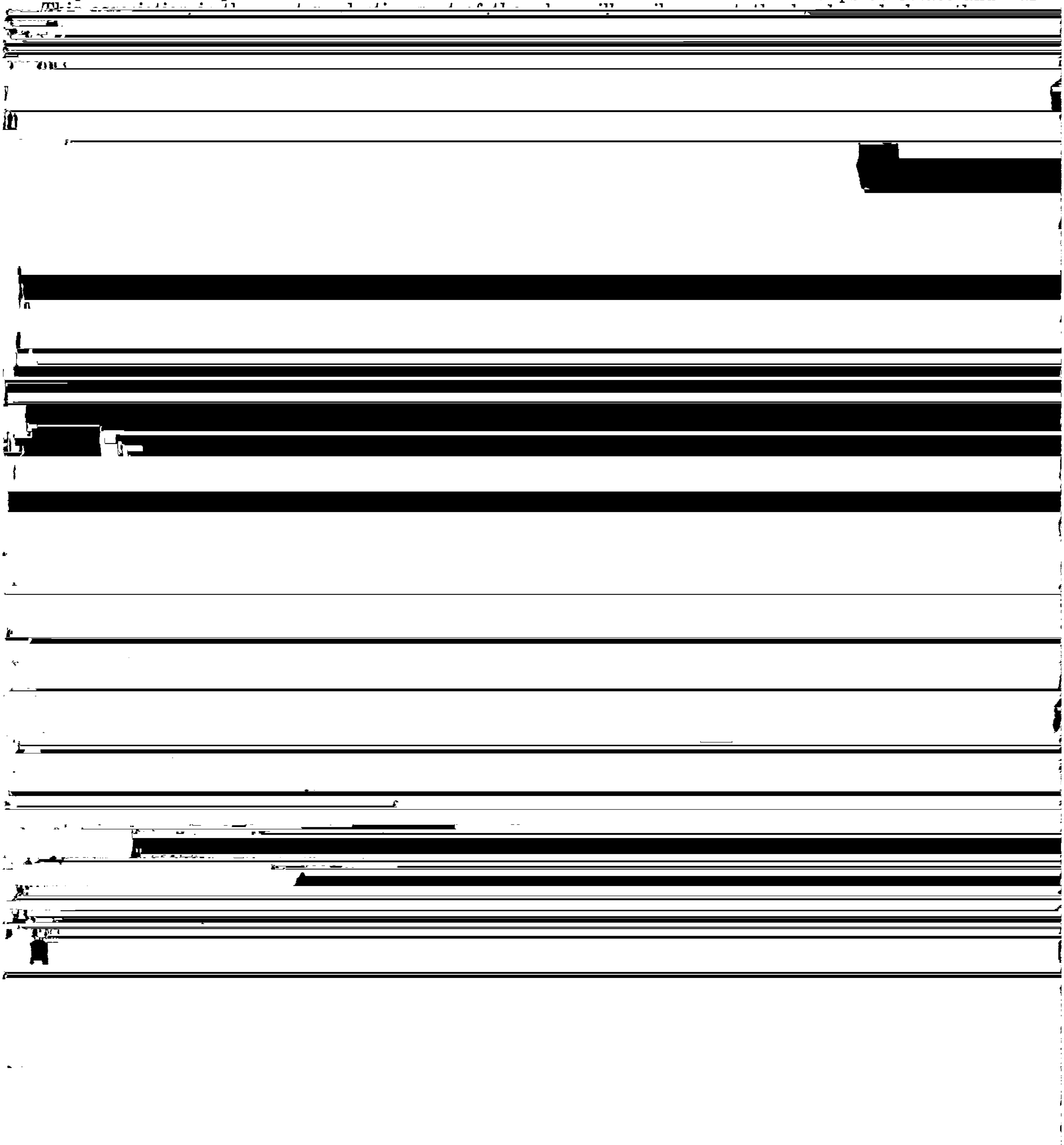
Water for home and livestock needs is obtained from wells, springs, lakes, streams, and cisterns. In some localities there is a shortage of water in seasons of drought. In the Moulton and Tennessee Valleys, adequate water is available at depths of 30 to 75 feet

descriptions of physiographic divisions and the soil associations in each follow.

Tennessee Valley Physiographic Division

The northern end of the county is in the Tennessee Valley physiographic division, which is a low undulating or rolling plain. The soil parent material is mostly reddish residuum weathered from St. Louis limestone of the Mississippian system (*1*) and old cent or less is in forest. A small acreage that was once cleared and cultivated has reverted to pine forest. The cleared acreage is used for crops and pasture. Cotton is the predominant crop.

tain physiographic division. It consists of undulating to rolling Tilsit and Linker soils with strips of hilly and steep Muskingum soils along the more deeply entrenched streams. Narrow strips of Cotaco and Bar-



legumes, and grasses. The areas less favorable for crops are used for pasture.

The large acreage of poorly drained soils is not suited to cultivation. Most of the better drained soils are less fertile, more difficult to till, and have a lower water-

Muskingum-Pottsville association

This soil association occupies all the hilly and steep Sand Mountain physiographic division in the southern part of the county. It consists predominantly of strongly sloping sandy and shaly Muskingum and Pottsothers may be slightly droughty or slightly wet, or

drained, light-colored soils with friable surare flooded for short periods, but the Huntington and Staser soils are regularly flooded. All the soils are deep and permeable, and they show good tilth. They are moderately to highly fertile but require moderate quantities of fertilizers and organic matter for highest yields. The capacity to hold available moisture is moderate to high, and the reaction is acid to neutral. Cultivation is not difficult, because the plow layer is friable. Overflow is the main hazard along streams, but drainage is not required. Some areas can be helped by installation of diversion ditches. Erosion is not a problem.

Nearly all of this association is cultivated. The soils can be used intensively, and they are especially good for corn, soybeans, most hay and pasture plants, and legumes. In dry years good yields of cotton can be obtained if management is good, but yields are low in wet years. Small grains generally lodge, and rust is more common than on the higher lying soils. If fertility and organic matter are maintained, row crops can be grown several years in succession. A good sequence is row crops followed by a winter cover of vetch or by a small grain that is turned under the following spring.

The favorable supplies of moisture in dry weather make these soils suitable for improved pasture. Forage plants respond well to fertilizers and, in many places, to lime. Weeds are more of a problem than on uplands, and they should be controlled by periodic mowing.

The subsoil has favorable supplies of moisture and allows roots to grow deeply. Consequently, these soils are good for loblolly and shortleaf pines and for the commercially valuable hardwoods.

CAPABILITY UNIT IIe-2

Well-drained, light-colored sandy loams and fine sandy loams with permeable subsoils, on gentle slopes:

- Allen fine sandy loam, eroded undulating phase.
- Hartsells fine sandy loam, eroded undulating phase.
- Jefferson fine sandy loam, eroded undulating phase.
- Linker fine sandy loam, eroded undulating phase.
- Nolichucky fine sandy loam, eroded undulating phase.
- Ruston sandy loam, undulating phase.
- Sequatchie fine sandy loam, eroded undulating phase.
- Sequatchie fine sandy loam, undulating phase.
- Waynesboro fine sandy loam, eroded undulating phase.

The Sequatchie soils are on low stream terraces, but all others occupy high stream terraces and uplands. The total area in this capability unit is 12,028 acres. These soils are low in organic matter and fertility and are medium to strongly acid. They have a moderately deep to deep root zone and a high capacity to hold available moisture. The soils are easily worked, and tilth is hard to maintain only where the subsoil is exposed.

All these soils can be used fairly intensively. However, the soils are susceptible to erosion and should not be used for row crops more than 1 year in 2 or 3 years. All cultivation should be along the contour, and if row crops are grown frequently, the land should be terraced. The soils are suited to cotton, small grains, alfalfa, and many truck crops. Additions of organic matter and large quantities of fertilizer are regularly needed for highest yields of crops. Lime is needed for

CAPABILITY UNIT IIe-1

Well-drained alluvial soils on gentle slopes, subject to short periods of overflow:

- Abernathy silt loam, undulating phase.
- Abernathy fine sandy loam, undulating phase.
- Barbourville fine sandy loam.

These soils occupy 6,370 acres on Little Mountain and in the Tennessee Valley. They are fertile and medium to slightly acid, and they contain a moderate amount of organic matter. In addition, they are permeable, are easily worked, and have a medium to high capacity to hold available moisture.

The soils can be used intensively for many kinds of

These soils are also good for pasture, if they are properly seeded and given fertilizer and lime. Dallisgrass, tall fescue, orchardgrass, whiteclover, and alfalfa grow well. Moisture is favorable for pasture, but it is not quite so abundant as in soils of capability units I-1, IIe-1, and IIw-1.

Soils of capability unit IIe-2 will grow loblolly and shortleaf pines and hardwoods. The terrain is favorable for tree planting and other forestry operations.

CAPABILITY UNIT IIe-3

Well drained to moderately well drained soils on gentle slopes that developed from weathered, acid, interbedded shale and sandstone:

used for crops or pasture. They are not so productive and cannot be used so intensively as the soils in capability units I-1, IIe-1, and IIw-1. They respond to management and need large quantities of plant nutrients and organic matter for high productivity. The soils are well suited to corn, cotton, soybeans, and small grains.

tall fescue, orchardgrass, and whiteclover. Lime is required for best growth of grasses and legumes; alfalfa requires boron.

The commercially valuable loblolly pine, yellow-poplar, and oaks grow well on these soils. However, little acreage is available for trees because the soils

Monongahela and Holston fine sandy loams, undulating phases.
Monongahela and Holston fine sandy loams, eroded undulating phases.

This unit occupies 4,839 acres in the Tennessee Val-

maintained at a high level. Most grasses and legumes need fertilizer and periodic applications of lime. Alfalfa requires boron. The growing season is noticeably shorter on these soils than on deep soils with less slope.

Loblolly and other pines are suited to these soils. The site index for trees on soils of this unit, especially on

This unit is widely distributed in the Moulton and the Tennessee Valleys, where it occupies 7,589 acres. The soils are moderately fertile, medium to strongly acid, and permeable to roots and moisture. Root zones are deep, and the capacity to hold available moisture is moderate. These soils contain a little more organic matter

ment so well as the more loamy soils, but their productivity can be improved by adding organic matter and large quantities of fertilizer. Small grains, legumes, and grasses are best suited to these soils. If properly managed, much of the acreage is moderately good for corn, cotton, and grain sorghum. Row crops should nessee and Moulton Valleys. A small area of Johnsburg soil is on Little Mountain. All of these soils are low in plant nutrients and organic matter, and they are medium to strongly acid. Their capacity to hold available moisture is only moderate, but the high water table is a fairly good source of moisture for crops during much of the growing season.

[illegible]

CAPABILITY UNIT IIIs-2

Very rapidly permeable soil on very gently sloping natural levees, subject to overflow:

Bruno loamy fine sand.

The area of this unit is 1,075 acres. The soil is medium acid and very low in plant nutrients and or-

CAPABILITY UNIT IVe-12

it is in hardwood forest. A small part is in cultivation.

CAPABILITY UNIT VIIe-1

Shallow acid soils with rock outcrops on the surface:

Gullied land, sandstone, material.
Muskingum stony fine sandy loam, hilly phase.
Muskingum stony fine sandy loam, steep phase.
Pottsville shaly silt loam, steep phase.
Stony steep land, Muskingum soil material.

These soils occur mainly in the southern one-fourth of the county, but some of the acreage is on Little Mountain. This is the most extensive capability unit in the county. The total area is 80,480 acres. Most of the acreage is in cutover forest made up of hardwoods intermixed with pine. A small acreage on the milder slopes is in pasture.

These soils are not suited to cultivation, and only the milder slopes are suitable for pasture. To develop and maintain a good stand of forage plants and to prevent erosion, the soil should be limed, fertilized, properly seeded, and carefully managed. Grazing should be controlled to avoid damage to the pasture.

Most of this unit should be used for forestry. The soils are suitable for loblolly and shortleaf pines, but their rate of growth varies according to the direction of slope. The north-facing slopes and those of low elevation are fairly good sites for trees. The south-facing slopes are dry and, consequently, poor for most trees. Virginia pine is suited to the drier sites. Yellow-poplar is best suited to the deeper, moist draws. Oak and hickory are suited to all but the driest sites. Forestry operations are more difficult on the stony

Stony rolling land, Talbott and Colbert soil materials.

The total area of this capability unit is 21,575 acres. Stony rolling land, Talbott and Colbert soil materials, contains enough soil to be moderately good for permanent pasture. However, the material is clayey and shallow to limestone bedrock, and it has a low capacity for holding available moisture. Much of it provides good grazing only during the wet parts of the growing season.

Under virgin conditions both rolling and steep Rockland limestone support dense stands of cedar and little grass. Most of the cedar has been severely cut over, and the rate of growth is slow. Some areas contain hardwood trees. These land types are best suited to cedar forest.

Estimated Yields

The estimated average yields that can be expected from the principal crops grown on soils of Lawrence County, under two levels of management, are given in table 2. The estimates shown are based mainly on information gathered through interviews with farmers, county agricultural workers, and others who have observed yields. The yields are as accurate as can be given without detailed and lengthy search of production records; they indicate the relative productivity of soils shown on the soils map.

Yields in columns A were obtained under the man-

TABLE 2.—*Estimated average acre yields of principal crops*—Continued

Soil	Corn		Cotton (lint)		Wheat		Oats		Lespedeza		Alfalfa		Potatoes		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Colbert silt loam:	*Bu.*	*Bu.*	*Lbs.*	*Lbs.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Ton*	*Ton*	*Ton*	*Ton*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Undulating phase	15	35	200	340	11	20	21	40	.6	1.0	1.3	2.5	----	----	70	130
Level phase	17	38	160	350	12	22	20	45	.7	1.2	----	----	----	----	75	140
Rolling phase	12	32	170	330	9	18	20	38	.5	1.0	1.2	2.4	----	----	60	120
Colbert silty clay loam:																
Eroded undulating phase	12	32	170	330	9	18	18	38	.5	1.0	1.2	2.4	----	----	60	120
Eroded rolling phase	10	25	140	300	7	14	17	32	.4	.9	1.1	2.2	----	----	50	100
Eroded hilly phase	9	23	130	280	6	12	15	30	.3	.8	1.0	2.0	----	----	45	90
Colbert cherty silt loam:																
Eroded undulating phase	10	35	140	300	7	14	12	30	.3	.8	----	2.2	----	----	50	110
Rolling phase	12	32	170	330	9	18	16	30	.4	.9	1.2	2.4	----	----	60	120
Colbert loam:																
Undulating phase	17	39	220	360	12	21	23	42	.6	1.1	1.3	2.5	----	----	70	130
Eroded undulating phase	12	32	180	340	10	19	18	39	.5	1.0	1.2	2.4	----	----	60	120
Rolling phase	14	34	190	340	10	19	21	39	.5	1.0	1.2	2.4	----	----	65	125
Eroded rolling phase	12	30	165	320	8	16	19	36	.4	.9	1.1	2.3	----	----	50	100
Hilly phase	11	28	160	310	8	15	18	35	.4	.9	1.0	2.2	----	----	50	100
Cotaco silt loam	25	58	----	----	----	----	----	----	.5	1.2	----	----	----	----	50	170
Cumberland loam:																
Undulating phase	32	55	380	580	20	27	35	57	.8	1.7	3.0	3.5	85	130	95	190
Eroded undulating phase	28	50	350	550	18	25	30	55	.8	1.6	2.8	3.4	80	120	90	175
Eroded rolling phase	24	47	300	510	15	23	27	48	.7	1.5	2.4	3.2	65	110	80	160
Decatur and Cumberland silt loams, undulating phases	32	55	380	580	20	27	35	57	.8	1.7	3.0	3.5	85	130	95	190
Decatur and Cumberland silty clay loams:																
Eroded undulating phases	28	50	350	550	18	25	30	55	.8	1.7	2.8	3.4	80	120	90	175
Eroded rolling phases	23	48	310	510	15	23	27	50	.7	1.5	2.4	3.2	65	110	80	165
Decatur and Cumberland silty clays:																
Severely eroded undulating phases	14	33	170	370	6	19	12	30	.3	.8	1.2	2.1	----	----	50	140
Severely eroded rolling phases	13	30	160	360	6	18	12	30	.3	.7	1.2	2.0	----	----	50	135
Gullied phases	----	28	----	350	----	17	----	28	----	.7	----	2.0	----	----	----	130
Dewey cherty silty clay loam:																
Eroded undulating phase	26	48	330	500	16	23	28	50	.7	1.5	2.1	3.2	75	115	80	160
Eroded rolling phase	21	44	300	490	14	20	25	48	.6	1.3	2.0	3.0	65	110	65	150
Dowellton silty clay loam	12	33	160	350	12	22	20	43	.4	.8	----	----	----	----	75	140
Dunning silty clay	22	40	----	----	----	----	----	----	.7	1.5	----	----	----	----	120	200
Enders loam:																
Rolling phase	20	40	220	400	9	18	22	42	.6	1.3	1.1	2.3	----	105	50	120
Eroded rolling phase	18	36	200	385	8	16	20	38	.5	1.2	1.0	2.1	----	95	45	115
Eroded undulating phase	21	42	220	420	10	18	23	44	.6	1.3	1.2	2.5	75	120	50	125
Etowah silt loam, undulating phase	30	60	350	550	18	25	32	55	.7	1.8	2.8	3.5	85	135	100	200
Etowah silty clay loam:																
Eroded undulating phase	28	58	350	550	17	25	30	53	.7	1.8	2.7	3.4	80	130	90	190
Eroded rolling phase	22	48	300	490	14	21	24	48	.6	1.4	2.2	3.1	65	110	75	155
Etowah loam:																
Undulating phase	30	60	350	550	17	24	30	53	.7	1.8	2.7	3.4	80	130	90	190
Eroded undulating phase	28	58	330	530	17	24	29	50	.7	1.8	2.6	3.3	80	130	85	185
Gullied land, sandstone material	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Hamblen fine sandy loam	30	60	200	480	----	----	30	50	1.2	1.8	----	----	----	----	125	190
Hartsells fine sandy loam:																
Eroded undulating phase	26	49	380	600	15	22	25	50	.8	1.5	----	2.8	150	200	55	150
Rolling phase	25	47	315	530	12	20	23	45	.7	1.3	----	2.6	135	190	45	140
Eroded rolling phase	24	46	310	510	12	20	23	45	.7	1.2	----	2.5	130	185	45	135
Hollywood silty clay	30	45	----	300	15	30	30	60	.5	1.0	----	----	----	----	100	180
Huntington silt loam	40	70	300	500	10	20	40	50	1.3	1.8	3.1	4.0	130	190	160	240
Jefferson fine sandy loam:																
Eroded undulating phase	24	45	320	520	14	21	26	50	.5	1.3	1.8	2.9	75	120	75	155
Rolling phase	22	42	290	500	13	19	24	46	.5	1.2	1.6	2.7	70	110	70	145
Eroded rolling phase	22	42	290	500	13	19	24	46	.5	1.2	1.6	2.7	70	105	65	145
Eroded hilly phase	17	40	260	440	12	16	22	44	.4	1.1	----	2.6	65	100	55	140
Johnsburg loam	22	46	280	480	12	22	24	46	.7	1.6	----	----	70	140	70	140
Lawrence and Colbert silt loams:																
Undulating phases	20	42	200	400	13	22	24	44	0.7	1.1	1.5	2.7	----	----	75	140
Rolling phases	12	32	170	330	9	18	20	38	.5	1.0	1.2	2.4	----	----	60	120
Lawrence and Colbert silty clay loams:																
Eroded undulating phases	15	36	180	360	10	19	20	40	.6	1.0	1.3	2.5	----	----	65	125
Eroded rolling phases	11	26	150	310	8	15	18	34	.5	.9	1.2	2.3	----	----	50	100
Lickdale silt loam [2]	----	40	----	----	----	20	----	38	.3	1.1	----	----	----	----	50	140
Lindside silty clay loam	40	70	----	400	----	18	----	48	1.4	1.8	----	----	----	----	170	240

See footnotes at end of table.

TABLE 2.—*Estimated average acre yields of principal crops*—Continued

Soil	Corn		Cotton (lint)		Wheat		Oats		Lespedeza		Alfalfa		Potatoes		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Linker fine sandy loam:	*Bu.*	*Bu.*	*Lbs.*	*Lbs.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Ton*	*Ton*	*Ton*	*Ton*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Eroded undulating phase	27	49	380	600	15	22	26	52	.8	1.5	—	3.0	150	200	60	150
Rolling phase	26	48	315	530	13	21	25	47	.7	1.4	—	2.9	135	195	55	145
Eroded rolling phase	24	46	310	510	14	21	25	47	.7	1.3	—	2.9	130	190	50	140
Eroded hilly phase	19	42	290	480	13	17	24	46	.5	1.2	—	2.8	90	130	45	145
Linker clay loam, severely eroded rolling phase	17	42	280	480	11	17	22	46	.3	1.2	—	2.8	60	130	40	145
Melvin silt loam [2]	—	55	—	—	—	—	—	—	.7	1.5	—	—	—	—	90	220
Monongahela and Holston fine sandy loams:																
Undulating phases	24	45	320	520	16	21	27	50	.6	1.4	1.8	2.9	80	120	75	155
Eroded undulating phases	24	45	320	520	16	21	27	50	.6	1.4	1.8	2.9	80	120	75	155
Level phases	27	50	340	520	18	25	30	55	.7	1.5	1.9	3.0	85	125	80	160
Muskingum fine sandy loam, hilly phase	15	30	165	330	7	13	18	34	.4	1.0	—	—	—	—	35	120
Muskingum stony fine sandy loam:																
Hilly phase	—	—	—	—	—	—	—	—	—	—	—	—	—	—	30	110
Steep phase	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20	65
Nolichucky fine sandy loam:																
Eroded undulating phase	25	47	300	510	15	22	25	48	.6	1.4	2.1	3.0	70	120	65	150
Eroded rolling phase	24	45	280	440	12	20	23	45	.5	1.1	—	2.8	65	110	55	135
Ooltewah silt loam [2]	40	70	—	400	—	18	—	48	1.4	1.8	—	—	—	—	170	240
Ooltewah fine sandy loam [2]	30	60	—	400	10	20	34	48	1.1	1.7	—	—	—	—	145	215
Philo fine sandy loam [2]	30	55	—	—	—	—	—	—	.7	1.5	—	—	—	—	100	210
Pottsville shaly silt loam:																
Hilly phase	15	30	165	330	7	13	18	34	.3	1.0	—	—	—	—	40	125
Steep phase	—	—	—	—	—	—	—	—	—	—	—	—	—	—	30	100
Prader silt loam [2]	—	50	—	—	—	—	—	—	.6	1.4	—	—	—	—	80	200
Robertsville silt loam [2]	—	45	—	—	—	30	—	45	.4	1.4	—	—	—	—	60	150
Rockland, limestone:																
Rolling	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Steep	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ruston sandy loam:																
Undulating phase	20	35	300	450	10	16	20	38	.5	1.0	—	—	65	110	40	100
Rolling phase	18	32	280	430	9	15	18	32	.5	1.0	—	—	60	100	40	100
Eroded rolling phase	18	32	280	430	9	15	18	32	.5	1.0	—	—	60	100	40	100
Sequatchie fine sandy loam:																
Undulating phase	27	60	350	550	18	25	30	55	.8	1.5	2.1	3.5	120	185	90	170
Eroded undulating phase	27	60	350	550	18	25	30	55	.8	1.5	2.1	3.5	120	185	90	170
Staser fine sandy loam	32	58	300	500	13	22	34	48	.8	1.5	2.7	3.6	110	190	100	190
Stony rolling land, Talbott and Colbert soil materials	—	—	—	—	—	—	—	—	—	—	—	—	—	—	40	75
Stony steep land, Muskingum soil material	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Talbott silt loam, undulating phase	20	42	260	450	16	32	28	47	.7	1.3	1.9	2.8	75	115	80	170
Talbott silty clay loam:																
Eroded undulating phase	18	38	240	410	15	21	27	45	.6	1.2	1.8	2.6	—	—	70	145
Eroded rolling phase	15	34	200	340	13	18	23	40	.4	1.0	1.5	2.1	—	—	60	125
Talbott silty clay:																
Severely eroded undulating phase	11	23	85	230	5	11	11	22	.3	.7	—	1.6	—	—	35	75
Severely eroded rolling phase	10	20	80	220	5	11	10	20	.3	.6	—	1.5	—	—	30	65
Talbott loam:																
Eroded undulating phase	20	40	250	420	16	22	28	47	.6	1.2	1.9	2.7	—	—	75	150
Eroded rolling phase	16	35	210	350	14	19	25	42	.5	1.1	1.6	2.2	—	—	65	130

Soils of Lawrence County

This section tells how soils are mapped and described,

For all other soils:

Slope classes	*Percent*	*Slope classes*	*Percent*
Nearly level phase	..0 to 2	Hilly phase	.....12 to 25

Undifferentiated soil groups consist of two or more soils, generally having several similarities in their

the difficulty of distinguishing the areas of the separate soils. Unlike the complex, the areas of the two or more soils are not necessarily intricately associated. Decatur and Cumberland silt loams, undulating phases, is an

they are dense and slowly permeable to moisture. In addition they are shallow or moderately shallow to

crops of limestone. The Talbott soils have a brown surface soil and a light-reddish, plastic subsoil. They are shallower to bedrock than the Dewey and Decatur soils and somewhat deeper than the Colbert and drainage distinguish the Enders, Tilsit, Johnsburg, and Lickdale series from each other. The Pottsville differs from these soils in having a more weakly developed profile and a shallower depth to shale bedrock.

The Enders soils are undulating to rolling. They have a loam surface soil and a strong-brown, firm clay loam or silty clay loam subsoil with fine to very fine mottled material below a depth of about 22 inches.

similar Decatur soils. It was impractical to map the Cumberland silt loam and Decatur soils separately, and they are shown on the soil map as undifferentiated Decatur and Cumberland soils. The Cumberland loams, however, are mapped separately because they can be distinguished from the Decatur soils by texture.

The Etowah soils have a dark-brown surface soil and a yellowish red, somewhat more friable subsoil. The mixed with materials from shale and limestone. Both series are undulating to hilly, and they are well drained. The Allen soils have a pale-brown to brown surface soil and yellowish-red subsoil. The area of Allen soils is about 5,636 acres. The Jefferson soils have a yellowish-brown surface soil and a reddish-yellow or yellowish-brown subsoil. Most of the acreage of Allen and Jefferson soils is at the base of Little Mountain, where they are in association with Muskingum and Pottsville soils, and at the base of Sand Mountain, where they are in association with the Talbott and Colbert soils. Jefferson soils have a total area of about 3,524 acres.

The Hollywood soil has a dark grayish-brown silty clay surface layer and a dark-gray plastic clay subsoil. that originated from limestone soils. These soils are all high in plant nutrients.

The Huntington soil is well drained, occupies only 132 acres, and is mostly along Town Creek. The Lindside soil is somewhat poorly drained to moderately well drained, and it occupies about 7,309 acres throughout the Moulton and Tennessee Valleys.

The Melvin and Dunning soils are poorly drained. The Dunning soil has a dark-gray to very dark grayish brown plastic silty clay surface soil. The Melvin surface soil is a dark-brown silt loam. The Dunning soil occupies 7,305 acres, and the Melvin, 6,300. Most of the Dunning soil is in Moulton Valley in association with the Dowellton, Colbert, and Talbott soils. The

TABLE 3.—*Approximate acreage and proportionate extent of soils*

Soil	Acres	Percent
Abernathy silt loam:		
Level phase	8,330	1.9
Undulating phase	3,479	.8
Abernathy fine sandy loam:		
Level phase	1,214	.3
Undulating phase	2,055	.5
Allen fine sandy loam:		
Eroded undulating phase	1,388	.3
Rolling phase	441	.1
Eroded rolling phase	2,318	.5
Eroded hilly phase	1,268	.3
Allen clay loam, severely eroded rolling phase	221	(1)
Atkins silt loam	3,831	.9
Barbourville fine sandy loam	836	.2
Baxter cherty silt loam:		
Eroded rolling phase	356	.1
Hilly phase	980	.2
Bruno loamy fine sand	1,075	.2
Colbert silt loam:		
Undulating phase	4,326	1.0
Level phase	841	.2
Rolling phase	839	.2
Colbert silty clay loam:		
Eroded undulating phase	9,197	2.1
Eroded rolling phase	2,478	.6
Eroded hilly phase	577	.1
Colbert cherty silt loam:		
Eroded undulating phase	326	.1
Rolling phase	386	.1
Colbert loam:		
Undulating phase	1,090	.2
[illegible]	[illegible]	[illegible]
Johnsburg loam	632	0.1
Lawrence and Colbert silt loams:		
Undulating phases	839	.2
Rolling phases	425	.1
Lawrence and Colbert silty clay loams:		
Eroded undulating phases	2,244	.5
Eroded rolling phases	1,331	.3
Lickdale silt loam	1,450	.3
Lindside silty clay loam	7,309	1.7
Linker fine sandy loam:		
Eroded undulating phase	3,140	.7
Rolling phase	6,010	1.4
Eroded rolling phase	5,930	1.4
Eroded hilly phase	1,076	.2
Linker clay loam, severely eroded rolling phase	358	.1
Melvin silt loam	6,300	1.4
Monongahela and Holston fine sandy loams:		
Undulating phases	1,001	.2
Eroded undulating phases	2,987	.7
Level phases	851	.2
Muskingum fine sandy loam, hilly phase	1,780	.4
Muskingum stony fine sandy loam:		
Hilly phase	2,649	.6
Steep phase	74,467	17.0
Nolichucky fine sandy loam:		
Eroded undulating phase	2,257	.5
Eroded rolling phase	796	.2
Ooltewah silt loam	8,764	2.0
Ooltewah fine sandy loam	1,772	.4
Philo fine sandy loam	872	.2
Pottsville shaly silt loam:		
[illegible]	[illegible]	[illegible]

[illegible]

Abernathy Series

Soils of the Abernathy series have formed from young local alluvium that washed from surrounding limestone soils. They occupy nearly flat or saucer-shaped swales that are subject to flooding and in places to ponding. They occur in the northern part of the county, mainly in the Tennessee Valley, and to a lesser extent in the Moulton Valley. They are associated with the Decatur and Cumberland soils and with other soils of the limestone valleys.

Abernathy silt loam, level phase (Ac).—This well-drained soil occurs in small areas that range from 1 to more than 40 acres.

Use and suitability.—Nearly all of this soil is in cultivation. The main crops are cotton and corn, but lespedeza, oats, soybeans, and sorghum are commonly grown. A small acreage is used for pasture. Fertilizers are commonly used but not in large quantities. Yields are high for nearly all the commonly grown crops.

This soil is well suited to intensive use for many crops It is also well suited to pasture because of abundant supplies of moisture. This soil is in capability unit IIe-1.

Abernathy fine sandy loam, level phase (Aa).—This soil differs from Abernathy silt loam, level phase, chiefly in content of sand. It occupies swales and medium acid, and permeable to roots and moisture. It has good tilth. Internal drainage is moderate. Moisture relations are good, but the available moisture-holding capacity is probably a little lower than that of the Abernathy silt loams.

Use and suitability.—Much of the acreage is used continually for row crops, mainly cotton and corn. Some of it is in hay or pasture. Fertilizers are used regularly, but not in large quantities.

This soil can be used intensively for nearly all crops commonly grown, including alfalfa. It is well suited to the more desirable legumes and grasses for pasture

cleared and is used mainly for cotton, corn, hay, and pasture. Small areas are idle part of the time. The row crops, especially cotton, receive moderate quantities of a complete fertilizer.

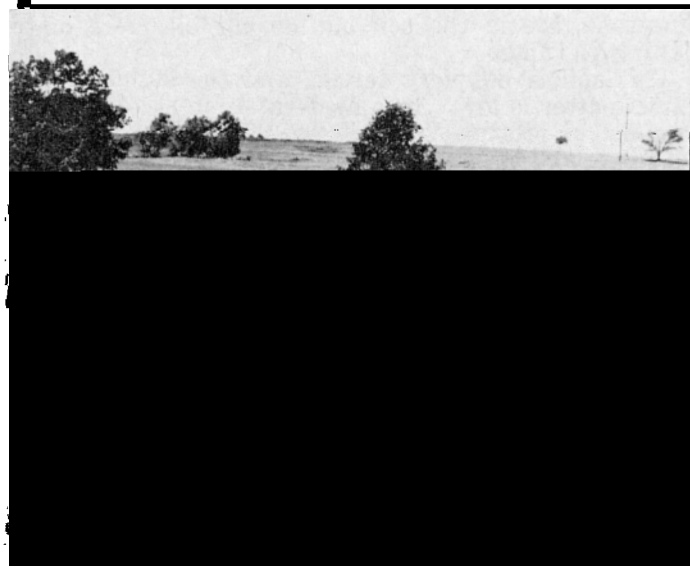
This soil responds to management, and it is well suited to cotton, corn, sorghum, and soybeans. It is also good for grasses and summer and winter legumes, including alfalfa for hay and pasture. Leguminous winter cover crops, chiefly vetch, are well suited. Large quantities of fertilizer are needed for high yields of crops on this soil. Runoff must be controlled to prevent erosion on the steeper areas. This soil is in roots and moisture, and it has a moderate capacity to hold water that plants can use. Moisture is least favorable in the severely eroded areas. Fragments of sandstone and limestone are in the soil but do not interfere greatly with tillage. The plow layer in most places consists of surface soil mixed with subsoil, but it has good tilth except in severely eroded areas.

Use and suitability.—All of this soil has been cleared and used for crops. Much of the acreage is now used

by farm machinery. The soil occupies small areas on slopes of 5 to 10 percent in association with the eroded undulating phase of Allen fine sandy loam.

The 4- or 5-inch surface layer consists of reddish-brown or red firm but friable clay loam. Below this is firm but friable red fine sandy clay. This material, at a depth of about 20 inches, grades to a red, moderately splotched with yellow, fine sandy clay loam or fine sandy clay. Fragments of carrying capacity is not high. A very small part of the better drained acreage may be used for crops, but

vation. A few spots are wet, but they are too small to map separately.



the depths to the underlying bedrock are somewhat greater. Slopes seldom exceed 2 percent. This is one of the less extensive Colbert soils. Most of it is in Moulton Valley in association with the Dowellton, Robertsville, and Hollywood soils and with other Colbert soils.

The 6- to 8-inch surface layer is light yellowish-brown silt loam. The subsoil is brownish-yellow plastic silty clay that grades to mottled material at depths

yellow silty clay loam. In many small areas all of the surface soil is gone and the plow layer is a brownish-yellow plastic silty clay. Limestone bedrock is at depths ranging from 1 to 3 feet, and there are occasional limestone outcrops.

This soil is low in organic matter. It tends to be droughty and is slowly permeable to roots and moisture. The plow layer has good to poor tilth, depending

4- or 5-inch surface layer is light yellowish-brown silt loam or silty clay loam. Below this layer and to a depth of about 10 inches is brownish-yellow plastic silty clay that grades to mottled plastic silty clay. Limestone bedrock is at depths ranging from ½ to 1½

of the subsoil to moisture and roots is slow. Tillage is difficult on the stony slopes.

Use and suitability.—About one-fourth of the acreage is in cutover forest consisting of hardwoods mixed with cedar. The rest of the acreage has been cleared and used for crops. Most of the cleared acreage is now used as unimproved pasture; small percentages are in reforested and idle areas. Unfavorable characteristics limit the suitability of this soil for crops. Permanent pasture is its best use. Good stands of legumes and grasses can be established by proper seeding and adequate fertilization. Droughtiness of the soil reduces the carrying capacity of pastures in dry parts of the growing season. This soil is in capability unit VIe-2.

Colbert cherty silt loam, eroded undulating phase (Cd).—This soil differs from Colbert silt loam, undulating phase, mainly in having chert in the plow layer that interferes with tillage. The chert was in the parent rock. This soil occurs with other Colbert soils.

A great part of the acreage has been eroded to the extent that the plow layer now consists of original surface soil mixed with subsoil. In most places it is a light yellowish-brown cherty silt loam. Below the plow layer is brownish-yellow, plastic cherty silty clay. This material grades to a mottled yellow and gray, plastic cherty silty clay at depths of 12 to 14 inches. Limestone bedrock or very cherty material is at depths ranging from 1½ to 3 feet.

In some places the subsoil is less cherty than the surface layer; in others chertiness increases with depth to the partly weathered, impure limestone parent rock. Over the small acreage that has not been materially eroded, the 5- or 6-inch surface layer is a light yellowish-brown cherty silt loam. In the few patches that have lost nearly all the surface soil, the plow layer is a brownish-yellow cherty silty clay or cherty clay.

[redacted]

ing original surface and subsurface layers mixed with the upper part of the subsoil. It is hard when dry and sticky when wet. More chert is concentrated on the surface in the eroded areas because the finer textured materials have been washed away. Limestone bedrock is at depths ranging from 1 to 3 feet. Outcrops and a few fragments of limestone are on the surface.

On some of the stronger slopes, chert has rolled down from higher lying bedrock and has accumulated mainly in the surface soil. The subsoil on these slopes commonly is brownish-yellow plastic silty clay or clay containing very little chert.

This soil is low in organic matter and medium to strongly acid. The subsoil is slowly permeable to moisture.

Use and suitability.—About half of this soil is in cutover forest consisting of hardwoods mixed with cedar. The rest of the acreage has been cleared and used for crops. Part of the cleared area is now used for cotton, lespedeza hay, and a few other crops, and part of it is in unimproved pasture or is idle. Cotton gets regular applications of moderate amounts of fertilizer. Winter cover crops are not very commonly grown.

The unfavorable characteristics of this soil make it poorly suited to cultivation. If properly fertilized, limed, and seeded, it will produce a desirable stand of pasture plants. The carrying capacity, however, is limited by lack of moisture during dry periods of the growing season. This soil is in capability unit IVe-12.

soil differs from the undulating phase of Colbert loam mainly in having lost much of the original surface soil through erosion. The plow layer now consists of a brownish-yellow loam or clay loam. In the more heavily eroded areas, the plow layer is mainly a brownish-yellow silty clay loam or clay. The subsoil is a brownish-yellow plastic silty clay grading to mottled parent material. Limestone bedrock is at depths ranging from 1 to 4 feet.

This soil is low in organic matter and medium to strongly acid. Tilth of the surface soil is fair, but workability becomes more difficult as the percentage of clay increases in the plow layer. The surface soil has a moderately good capacity to absorb moisture, but the permeability of the clayey subsoil to moisture and roots is slow. Colbert loam is subject to erosion because of the moderately friable surface soil and relatively tight subsoil. This soil responds to adequate fertilization and to other good management practices.

Use and suitability.—All of this soil has been cleared and used for crops. Most of it is now used mainly for cotton, lespedeza, and pasture. Some acreage is used for corn, grain sorghum, and hay other than lespedeza. This soil is suitable for cultivation, but the number of crops that can be grown and the yields are restricted by unfavorable characteristics. If this soil is properly fertilized and seeded, a desirable stand of pasture plants can be established. The pasture carrying capacity, however, is reduced by droughtiness in dry weather. This soil is in capability unit IIIe-12.

plastic, very firm clay or silty clay. The subsoil is a mottled yellow and gray plastic clay or silty clay. Limestone bedrock is at depths ranging from ½ to 2½ feet. Rock outcrops are fairly common, but they do not seriously interfere with tillage.

This soil is low in organic matter and medium to strongly acid. The subsoil is slowly permeable to roots and moisture, and its capacity to hold water that plants can use is low. Runoff becomes rapid if this soil is cropped, particularly in areas used for row crops. Internal drainage remains slow but is offset by slow absorption. As a result, internal drainage is ample to excessive throughout the growing season.

Erosion has increased the rate of runoff and impaired workability, tilth, and moisture absorption. Much of the friable surface soil has been washed away, and subsoil material has been exposed. As a result, the soil is harder to work and the range in moisture content suitable for tillage has been narrowed. The soil puddles if worked when too wet and clods if worked when too dry.

Use and suitability.—This soil has all been cleared and used for crops. A considerable acreage is now idle or in unimproved pasture, and a part is used mainly for cotton and lespedeza. Cotton is fertilized regularly, but other crops are not. The soil responds to adequate fertilization, but its unfavorable characteristics make it only fairly well suited to cultivation. If properly managed, good stands of desirable legumes and grasses can be developed for pasture. The carrying capacity, however, is limited during the dry parts of the growing season. This soil is in capability unit IVe-12.

Colbert loam, hilly phase (Ch).—This soil differs from the rolling phase of Colbert loam chiefly in slope. It also differs in having less depth to bedrock and more numerous rock outcrops. Slopes range from 12 to 20

forestry. Colbert loam, hilly phase, is in capability unit VIe-2.

Cotaco Series

Cotaco silt loam (Ct).—This somewhat poorly drained soil has formed from young local alluvium that washed from adjacent higher lying Tilsit, Linker, and associated soils. It has parent material similar to that of the Barbourville soils. It differs from those soils, however, in being less well drained. Cotaco silt loam occupies gently sloping strips along the upland drainageways and at the heads of draws on the smooth uplands of Little Mountain.

Profile description:

0 to 12 inches, light yellowish-brown silt loam; the upper 4 inches contains organic matter in noticeable amounts.

12 to 24 inches, mottled gray and yellowish-brown silty clay loam; very friable; weak or very weak blocky structure.

24 to 36 inches, mottled yellow, gray, and brown fine sandy loam to fine sandy clay loam or silt loam; more or less stratified.

Sandy shale or sandstone bedrock is at depths ranging from 2½ to 6 feet or more.

The subsoil is somewhat more sandy in places. In some areas it contains, at depths ranging from 8 to 15 inches, a comparatively dark layer that was an old surface soil before the alluvium was deposited.

This soil is strongly acid, and it contains moderate amounts of organic matter and fair amounts of plant nutrients. Its capacity to hold water that plants can use is high. The surface layer has good tilth; roots and moisture penetrate the subsoil easily. The position on the landscape favors good moisture relations during most of the growing season. In the warm, very old remnants of stream terraces. They occur with soils formed in place, as the Decatur, Dewey, and Talbott soils. The Cumberland silt loams, silty clays, and silty clay loams are so similar to the Decatur soils and occur in such intricate association that it was difficult to map them separately. Accordingly, they have been mapped with the Decatur soils as undifferentiated Decatur and Cumberland mapping units.

Cumberland loam, undulating phase (Cc and Cw).—The maximum slopes of this soil are generally 3 percent but in places are as much as 6 percent. This soil occurs with the Etowah, Nolichucky, and Waynesboro soils in the Tennessee Valley.

Profile description:

0 to 5 inches, grayish-brown to dark-brown loam.

5 to 9 inches, reddish-brown silt loam to silty clay loam; friable.

9 to 20 inches, reddish-brown to red silty clay loam; firm but friable; medium subangular blocky structure.

20 to 50 inches, dark-red or dark reddish-brown silty clay; streaks or splotches of yellow and gray increase with depth; firm; structural aggregates are coarser as depth increases.

Limestone bedrock is at depths ranging from 4 to 20 feet.

The loam layer ranges from 9 to 12 inches in thickness. In the severely eroded areas, the surface layer below the plow layer is dark reddish-brown or red firm silty clay loam or silty clay. Very small dark concretions are common throughout the subsoil. A few small rounded pebbles of quartzite occur.

This soil contains moderate amounts of organic matter in the plow layer, except where all of the original surface soil has been lost. It is medium to strongly acid and has a moderately high capacity to hold water that plants can use. The capacity to absorb moisture has been greatly reduced in the severely eroded areas. The soil responds well to fertilization and holds plant nutrients well. Tilth of the plow layer in the less eroded areas is good; in the severely eroded areas it is poor because of the plastic clay in the plow layer. The subsoil is permeable to roots and moderately permeable to moisture.

Use and suitability.—All of this soil has been cleared and used for crops. A large percentage is now used mainly for cotton and for winter legumes in rotation with cotton. Corn, lespedeza, grasses and other legumes for hay are also commonly grown. Part of the acreage is in pasture.

Favorable characteristics make this one of the most desirable soils of the county. It is suitable for many kinds of crops, including cotton and grasses and alfalfa and other legumes for hay or pasture. Productivity is easily maintained. Runoff should be controlled on the stronger slopes. This soil is in capability unit IIe-7.

crops. Cumberland loam, eroded rolling phase, is in capability unit IIIe-8.

Decatur and Cumberland Soils

In Lawrence County, soils of the Decatur series and the Cumberland series occur in intricate association

The surface soil is 6 to 10 inches thick. Small dark concretions are common throughout this soil, especially in the subsoil. In places there is a noticeable quantity of sand to depths of 2 or 3 feet and a few small rounded pieces of quartzite gravel.

Decatur and Cumberland silt loams, undulating cotton in the Tennessee Valley and for cotton and corn in the Moulton Valley.

This mapping unit contains some of the most desirable agricultural soils in the county. It is especially suitable for cotton and for alfalfa and other deep-rooted legumes. It is also suitable for many other crops, including corn and legumes and grasses for hay and pasture. The more severely eroded areas are less well suited to corn and truck crops, because of the reduced supply of available moisture. These soils respond well to management and fertilization, and high productivity is easily maintained. The areas of

Decatur and Cumberland silty clays, severely eroded undulating phases (Df).—Areas of this mapping unit are small and irregular. They range from less than 10 to about 40 acres in size. Slopes range from 2 to 6 percent.

These soils have lost nearly all the original surface soil and, in places, part of the subsoil. The 4- or 5-inch surface layer consists of dark reddish-brown or dark-red firm or very firm silty clay. The transition from the surface soil to the subsoil is very abrupt. The subsoil, similar to that of the less eroded undulating phases, becomes very firm and more clayey as depth

Some of the acreage is idle or in unimproved pasture. Crop yields are low, but they can be improved because the soils are moderately fertile and respond fairly well to management. The soils need adequate control of runoff and erosion and additional organic matter to improve soil structure. These soils are in capability unit IIIe-8.

Decatur and Cumberland silty clays, severely eroded rolling phases (De).—This mapping unit has lost nearly all the original surface soil and in places parts of the upper subsoil. It occupies small areas on slopes ranging chiefly from 6 to 12 percent.

The 4- or 5-inch surface layer is a dark reddish-brown to dark-red firm or very firm silty clay. It consists mainly of upper subsoil, which extends to depths ranging from 20 to more than 48 inches. Below this layer is a red, very firm silty clay, splotched with yellow and gray. Limestone bedrock is at depths ranging from 3 to 15 feet.

These soils have a fairly large amount of plant nutrients and are medium to strongly acid. Erosion has reduced the supply of organic matter, impaired tilth and workability, and decreased moisture absorption. The soils are permeable to moisture and roots, and they have a low capacity to hold water that plants can use. However, they are droughty during dry periods of the growing season, because of their reduced capacity to absorb and hold moisture from summer rains. Small gullies are common, but they can be easily filled in by use of heavy tillage implements; a few are difficult to cross with machinery.

Use and suitability.—All areas of these soils have been cleared and cultivated. Much of the acreage is still cropped, but a considerable part is in unimproved pasture, volunteer forest, or idle areas. Cotton is the chief crop, but lespedeza, corn, soybeans, grain sorghum, small grains, and hay are also grown. A small acreage is in improved pasture. Fertilizers are

stone bedrock is at a shallow depth in these areas. Included areas of gullied Allen soils are red, moderately friable, and moderately deep to limestone bedrock.

Gullies in the Decatur, Dewey, Cumberland, Talbott, and Colbert soils can be filled in by use of heavy tillage implements. Gullies in the Allen soils are several feet deep and require special treatment.

This mapping unit is generally very low in organic matter, but there is a fair to moderate supply of plant nutrients in some places. Practically all of it is medium to strongly acid. The surface layer has poor tilth, and infiltration of moisture has been noticeably reduced. The subsoil usually is permeable to roots and moisture, but its capacity to hold water that plants can use is very low. Consequently, the soils are limited in moisture during dry periods of the growing season.

Use and suitability.—All of this mapping unit has been cleared and cultivated. Most of it is now idle or reseeding to forest trees. Most of the acreage can be made suitable for cultivation if the fields are smoothed and made tillable, large quantities of fertilizer are applied, and tilth is improved by additions of organic matter. If carefully managed to maintain productivity, the soils can be used for cotton and the deeper rooted legumes. However, the best use for most of the acreage is permanent pasture. This mapping unit is in capability unit IVe-2.

Dewey Series

Soils of the Dewey series are well-drained upland soils. They have formed from limestone of moderately high grade. Like the Decatur soils, they are fertile and deep to bedrock, but they differ from them chiefly in having a lighter brown surface soil and a lighter red somewhat more friable upper subsoil. Dewey soils in Lawrence County contain enough chert to interfere with tillage. Practically all their small total acreage the most severely eroded areas the plow layer is yellowish-red cherty silty clay loam.

This soil is moderately fertile, but it is somewhat less fertile than the Decatur and Cumberland soils. It is medium to strongly acid and has a moderate capacity for holding water that plants can use. The surface layer contains a small amount of organic matter where erosion has not been very severe. Tilth of the plow layer is generally good, except in severely eroded areas where the soil is clayey. The firm subsoil retards percolation, but it is permeable to roots and moisture. Drainage is adequate for all crops, including cotton and alfalfa.

Use and suitability.—Nearly all of this soil has been cleared and cultivated. Most of it is now used mainly for cotton, but smaller acreages are in corn or hay, chiefly lespedeza and alfalfa. Some acreage is in small grains, soybeans, grain sorghum, and field peas. Cotton is fertilized moderately heavily, and part of the cotton acreage is used in rotation with winter legumes.

This soil responds well to fertilizer, and productivity can be kept moderately high without difficulty. Its favorable characteristics make it suitable for many kinds of crops, including cotton, corn, alfalfa, small grains, soybeans, and practically all of the legumes and grasses commonly grown for hay or pasture. There is some risk of erosion on the stronger slopes, but erosion can be controlled without difficulty. This soil is somewhat less desirable for general agriculture than the Decatur and Cumberland soils. Dewey cherty silty clay loam, eroded undulating phase, is in capability unit IIe-7.

Dewey cherty silty clay loam, eroded rolling phase (Dg).—This soil differs from the eroded undulating phase of Dewey cherty silty clay loam chiefly in slope. In most places gradients range from 6 to 12 percent. The 4- or 5-inch surface layer is a brown to reddish-

the more desirable legumes and grasses for hay and pasture. In some places the chert on the surface makes the harvesting of hay somewhat difficult. Cultivation on the strong slopes should be along the contour to prevent erosion. Rotations should include close-growing crops to protect the soil, especially in winter. This soil is in capability unit IIIe-8.

Dowellton Series

Dowellton silty clay loam (Dk).—This somewhat poorly drained, plastic, clayey soil has developed from argillaceous limestone. It differs from the Colbert soils in being more poorly drained and, consequently, in having a less well-developed profile. The relief is nearly level to gently undulating. Most of the soil is in the west end of the Moulton Valley. A few small areas are in other parts of the Moulton Valley and in the southwestern part of the Tennessee Valley.

Profile description:

0 to 3 inches, brown or grayish-brown silty clay loam with mottles of gray.

3 to 8 inches, mottled yellowish-brown and light-gray clay; very firm; extremely plastic.

8 to 36 inches, mottled brownish-yellow, gray, and red clay; very firm; extremely plastic.

Limestone bedrock is normally at depths of 1 to 3½ feet, but it is exposed in a few places.

This soil is low in plant nutrients and organic matter and medium to strongly acid. The capacity for holding available moisture is low; consequently, the soil is droughty in dry periods. The plow layer has poor tilth because it is plastic and firm. Infiltration is low, and the soil is not easily penetrated by roots and moisture. Internal drainage is very slow, and surface drainage is slow.

brown silty clay; some concretions of brown to dark brown; plastic.

4 to 10 inches, very dark gray silty clay; numerous concretions of dark brown; very firm; extremely plastic.

10 to 36 inches, mottled very dark gray or olive-gray, brown and yellowish-red clay; very firm; extremely plastic.

Limestone bedrock is at depths ranging from 3 to 6 feet or more.

This soil is fertile and contains considerable amounts of organic matter in the upper 8 to 10 inches. It is ordinarily neutral to slightly acid, but some areas are medium acid. The soil absorbs moisture slowly, and it is not very permeable to roots or moisture. The plow layer has only fair tilth, but when the moisture content is favorable, it can be worked to a fairly good seedbed. The supply of moisture is normally too great, but drainage will make the soil more favorable for crops.

Use and suitability.—Some of this soil has been cleared, but a large percentage of it is still in forest consisting of water-tolerant hardwoods mixed with cedar. A large part of the cleared acreage is now in unimproved pasture of only fair quality. The soil can be improved for cultivation by adequately draining it through use of ditches. Tile drainage is not practicable, because the subsoil is compact and extremely plastic. If adequately drained and properly seeded to good pasture plants, this soil probably is best suited to permanent pasture. The carrying capacity will be high except in the wettest part of the growing season. Dunning silty clay is in capability unit IVw-2.

Enders Series

Soils of the Enders series are on uplands. They have developed from acid interbedded sandstone and shale. They are well drained and of moderate depth to bedrock. They occupy narrow ridgetops on Sand Mountain in association with the steep Muskingum soils.

Enders loam, rolling phase (Ec).—This soil is on slopes that range from 5 to about 10 percent. It is the most extensive soil of the Enders series.

Profile description:

0 to 4 inches, light yellowish-brown loam; friable; upper inch contains considerable partly decomposed organic matter that makes it noticeably darker than the rest of layer.

4 to 11 inches, yellowish-brown silty clay loam; friable; a few thin fragments of sandstone or sandy shale.

11 to 20 inches, strong-brown clay to silty clay loam; firm to very firm or compact; breaks easily to subangular fragments ½ to 1 inch in diameter.

20 to 36 inches, mottled strong-brown, yellow, and red silty clay or clay; very firm; tough.

36 to 46 inches, red, gray, and pale-yellow thinly interbedded shale and sandstone; laminated; partly weathered; gradual transition to weathered, firmer bedrock of interbedded shale and sandstone.

Thin fine fragments of sandstone or sandy shale are common throughout the profile. In some places, below a depth of 20 inches, the texture of the parent material ranges to silty clay loam. The quantity of shale and sandstone in the bedrock varies from place to place.

This soil is low in plant nutrients and organic matter and strongly to very strongly acid for its entire depth. It is well drained or moderately well drained and has a moderate capacity to hold moisture that plants can use. The firm subsoil impedes infiltration, but roots and moisture penetrate with moderate ease.

Use and suitability.—A large part of this soil is still in cutover hardwood forest because the narrow ridges on which it occurs are flanked by extensive areas of Muskingum soils that are very poorly suited to crops or pasture. Enders loam, rolling phase, is moderately well suited to cultivation, but productivity is limited by shallowness to bedrock and inadequate available moisture. Under present conditions, forestry is the best use of this soil. It is in capability unit IIIe-3.

Enders loam, eroded rolling phase (Ea).—This soil is south of Moulton; it occupies slopes ranging from 5 to 10 percent. It has been eroded to the extent that the plow layer now consists of original surface soil mixed with subsoil. This 4- or 5-inch layer is yellowish-brown loam. Below the plow layer is strong-brown firm to very firm or compact silty clay or silty clay loam. Below a depth of about 20 inches is mottled strong-brown, yellow, and red, very firm silty clay that grades to partly disintegrated shale and sandstone at a depth of about 36 inches.

In most places fine thin fragments of sandstone or sandy shale are in the profile. On the more exposed slopes where nearly all of the original surface soil is gone, the plow layer is a very firm, strong-brown silty clay.

This soil is low in plant nutrients and organic matter and strongly to very strongly acid. The capacity for holding moisture for plants is moderate. The soil is droughty during dry parts of the growing season, as infiltration of moisture is slow. The plow layer has fairly good tilth, except where the subsoil has been exposed. This clayey plow layer should not be worked when it is wet. The very firm subsoil retards infiltration of moisture, but moisture and roots penetrate the soil fairly well. Drainage is generally fairly good.

Use and suitability.—This soil has been cleared and cultivated. It is inside the William B. Bankhead National Forest, and most of it is now idle or reforesting. This soil is thought to be suited to cultivation, but its undesirable characteristics greatly limit its productivity and range of suitability for crops. This soil is in capability unit IIIe-3.

Enders loam, eroded undulating phase (Eb).—This moderately well drained soil differs from the rolling phase of Enders loam chiefly in having less slope and greater depth to bedrock. Slopes range up to 5 percent.

The 4- or 5-inch surface layer in most places consists of original surface soil mixed with subsoil; it is a light yellowish-brown loam. Below this and to a depth of about 16 inches is strong-brown, compact, firm to very firm sity clay loam or silty clay. Between the depths of 16 and about 25 inches is mottled strong-brown, yellow, and red very firm or tough silty clay. Below 25 inches is red, gray, and pale-yellow partly weathered, interbedded sandstone and shale.

terial is similar to that of Etowah silt loam, undulating phase. On the more exposed, stronger slopes, nearly all of the original surface soil is gone and the plow layer is a yellowish-red friable silty clay loam. In places there are chert fragments in the subsoil, but they do not interfere materially with tillage. Much of the acreage is eroding.

This soil is fertile, and it is permeable to roots and moisture. It has a moderately high capacity to hold moisture that plants can use. Infiltration of moisture in the more eroded areas is somewhat slower than it is in the less eroded areas. Tilth of the plow layer is fairly good, except on the severely eroded areas containing too much clay. In these spots the soil is harder to work and puddles easily if worked when too wet.

Use and suitability.—All of this soil has been cleared and cultivated. Most of it is now used mainly for cotton, but corn, winter legumes, soybeans, grain sorghum, and hay, chiefly alfalfa and lespedeza, are also grown. Cotton is commonly fertilized.

This soil is suitable for many crops, but they should be grown in moderately long rotations made up of grass, small grains, and hay. All cultivation should be along the contour, and in places terraces should be built. This soil is also well suited to pasture consisting of grasses and legumes. Etowah silty clay loam, eroded rolling phase, is in capability unit IIIe-8.

Etowah loam, undulating phase (Ee).—This well-drained soil occurs in areas ranging from a few acres to about 20 acres in size. It is associated with the Waynesboro, Nolichucky, Monongahela, Holston, and Robertsville soils and with other Etowah soils.

Profile description:

- 0 to 6 inches, brown to dark-brown loam.
- 6 to 22 inches, yellowish-red to red clay loam or silty clay loam; friable but firm.
- 22 to 45 inches, predominantly red silty clay loam; friable but firm; breaks easily to irregular fragments ranging from ½ to 1 inch in diameter.
- 45 inches +, red or yellowish-red silty clay, weakly splotched or mottled with yellow and gray; friable.

Limestone bedrock is at depths ranging from 4 to 20 feet or more.

In areas that have impaired internal drainage, the surface layer is a yellowish-brown to dark-brown loam. Below this layer and to a depth of about 25 inches is strong-brown to yellowish-red friable clay loam or silty clay loam. At depths between 25 and about 32 inches, the material is mottled red and yellow friable silty clay loam that breaks easily to fragments of fine angular blocky structure. At a depth of about 32 inches the material is predominantly red silty clay mottled with yellow.

This soil is medium acid. Moisture is readily absorbed, and the soil has a moderately good capacity to hold moisture that plants can use. The surface layer has good tilth, and the subsoil is permeable to roots and moisture.

Use and suitability.—Most of this soil has been cleared and cultivated, but some of the acreage is still in cutover hardwood forest. The cultivated acreage is the acreage is in pasture. Row crops, chiefly cotton, are fertilized moderately heavily.

This is one of the more desirable soils for crops and pasture. It is suitable for practically all the commonly grown crops, including cotton and alfalfa. It responds to management, and it is easily worked and conserved. This soil is in capability unit IIe-7.

Etowah loam, eroded undulating phase (Ed).—This well drained to moderately well drained soil differs from the undulating phase of Etowah loam mainly in having lost part of the original surface soil through erosion. It occurs on areas ranging from 20 to more than 80 acres in size and occurs with the Cumberland, Decatur, Waynesboro, Nolichucky, and Monongahela soils and with other Etowah soils.

The plow layer consists of remnants of the original surface soil mixed with the upper part of the subsoil. The 4- or 5-inch surface layer in most places is a brown to yellowish-red loam. In the more eroded areas this layer is a clay loam. Below the plow layer, the material is similar to that of Etowah loam, undulating phase.

In places chert fragments occur on the surface and in the subsoil. In places in some of the smoother areas the surface soil is a brown to dark-brown loam 6 to 8 inches thick.

This soil is medium acid, and it has a moderate capacity to hold moisture that plants can use. Moisture infiltrates fairly well, and runoff is generally not a serious hazard. The subsoil is permeable to roots and moisture. Tilth is good.

Use and suitability.—All of this soil has been cleared and cultivated, and most of it is now used mainly for cotton. Alfalfa, corn, soybeans, grain sorghum, winter legumes, and hay, chiefly lespedeza, are also grown. Some of the acreage is in pasture. Row crops are fertilized regularly, and they are grown several years in succession.

This is one of the more desirable soils for crops and pasture. Erosion is somewhat of a hazard on the stronger slopes, but it is not difficult to control if management is good. The favorable characteristics of this soil and its response to management make it suitable for fairly intensive use. It is good for many kinds of crops, including cotton, alfalfa, and the more desirable legumes and grasses for hay and pasture. This soil is in capability unit IIe-7.

Gullied Land

Gullied land, sandstone material (Ga).—This mapping unit consists of eroded and gullied sandy soils underlain by sandstone. Over most of the area nearly all of the original surface soil is gone, and many gullies have formed that are too deep to be crossed by most farm machinery. The gullies generally are not more than 3 or 4 feet deep, but they have reached bedrock. Bedrock is exposed on the sandstone plateaus. The slopes range from 5 to 20 percent. This land occurs with the Enders, Linker, and Hartsells soils on mountain tops and with the Allen and Jefferson soils at the foot of mountain slopes.

This land type is low in plant nutrients, very low in organic matter, and strongly to very strongly acid. It

Use and suitability.—All of this mapping unit has been cleared and cultivated. Practically all of it is

forage is in demand during dry parts of the growing season. Fescue and whiteclover are probably the most ture. It responds well to proper fertilization, and high yields can be expected if management is good. The soil needs control of runoff if row crops are grown continually. The need is greatest on the stronger slopes. This soil is in capability unit IIe-2.

Hartsells fine sandy loam, rolling phase (Hd).—This soil differs from the eroded undulating phase of Hartsells fine sandy loam chiefly in having slopes of 5 to 10 percent. It occurs on narrow winding ridges in the eastern half of the Sand Mountain area.

This soil has not been cultivated; consequently, it has not been damaged by erosion. The surface soil, about 10 inches thick, is a light yellowish-brown fine sandy loam. The upper 2 inches contain noticeable amounts of organic matter. From a depth of 10 inches down to about 28 inches there is a yellowish-brown fine sandy loam to sandy clay loam. The lower part of this layer may be strong brown. Below a depth of 28 inches is yellowish-brown or strong-brown fine sandy loam or loamy fine sand somewhat splotched with reddish brown. Sandstone bedrock is at depths ranging from 1 to 3 feet. In a few areas bedrock is at or very near the surface, but it does not greatly interfere with tillage.

This soil is low in plant nutrients and organic matter and strongly to very strongly acid. It is easily worked and responds to management. The rate of infiltration is rapid, but the capacity to hold moisture

cotton. This soil is suited to many kinds of crops, but it requires cultivation along the contour, consistent use of fertilizers, and crop rotations of moderate length. Although the soil is not particularly erosive, it can be damaged through erosion if row crops are grown continually. Hartsells fine sandy loam, eroded rolling phase, is in capability unit IIIe-2.

Hollywood Series

Hollywood silty clay (He).—This somewhat poorly drained clayey soil is forming chiefly from local alluvium or colluvium derived from argillaceous limestone. It occupies slopes that seldom exceed a gradient of 3 percent. The areas are 5 to about 30 acres in size and occur in association with the Talbott, Colbert, and Dunning soils and with Rockland, limestone material. Most of the acreage is in the Moulton Valley, but a few small areas are in the southwestern part of the Tennessee Valley.

Profile description:

- 0 to 20 inches, dark grayish-brown to nearly black silty clay; plastic.
- 20 inches +, dark-gray clay mottled with reddish yellow and brown; plastic to very plastic.

Limestone bedrock is at depths ranging from 1 to 5 feet.

The surface layer is 5 to 20 inches or more in thickness, and in some places it is a dark-gray silt loam.

some of the larger creeks in the Tennessee Valley. Much of this soil is permanently covered by the waters of Wheeler Reservoir.

Profile description:

relations favor its use for midsummer pasture. A good stand of pasture plants is easily maintained. Cotton is particularly susceptible to attacks of the boll weevil, and boll formation is poor. Small grains commonly lodge, and they are highly susceptible to dissoil differs from the eroded undulating phase of Jefferson fine sandy loam chiefly in having stronger slopes and less erosion. It occupies 5- to 10-percent slopes. It is associated with other Jefferson soils and is directly below the steep Muskingum and Pottsville soils.

The 5-inch surface layer is pale-brown fine sandy loam. Below this material, to a depth of 26 inches, is light yellowish-brown to yellowish-brown fine sandy clay loam or fine sandy clay. This layer is moderately firm but friable, and it breaks into subangular fragments ranging from ¼ to 1 inch in diameter. Below

pasture, but many areas are idle or are reseeding to pine and other trees. Cotton is the chief crop, but corn and lespedeza are commonly grown. Cotton usually gets moderately heavy applications of fertilizer; small amounts are used for corn. Little fertilizer is used on other crops.

This soil is suitable for many kinds of crops and for pasture. However, unfavorable characteristics limit its suitability for cultivated crops. Moderately long rotations and large quantities of fertilizer should be occupies moderately low, nearly flat upland divides, very gently sloping benches, and slight depressions, chiefly at the heads of drainageways. Slopes are gentle to very gentle, and the low-lying areas are temporarily covered by water after heavy rains. This soil occurs in small and widely distributed areas on the broad ridgelands of Little Mountain. It is associated with the Tilsit soils but differs from them chiefly

Profile description:

0 to 4 inches, grayish-brown loam; friable.
4 to 10 inches, yellowish-brown or pale-brown silt loam or loam; friable.

Lawrence soils are in the lower parts of depressions. Most of the acreage of these undifferentiated soils is along the border between the Little Mountain and the Moulton Valley physiographic divisions. Some acreage occurs throughout the Moulton Valley.

Lawrence and Colbert silt loams, undulating phases (Pd).—Slopes on these soils reach a maximum of 6 percent. Most areas occur southwest of Masterson Mill

this mapping unit has a profile similar to that described for Colbert silt loam, undulating phase. Lawrence silt loam has a profile as follows:

0 to 8 inches, light yellowish-brown silt loam; the

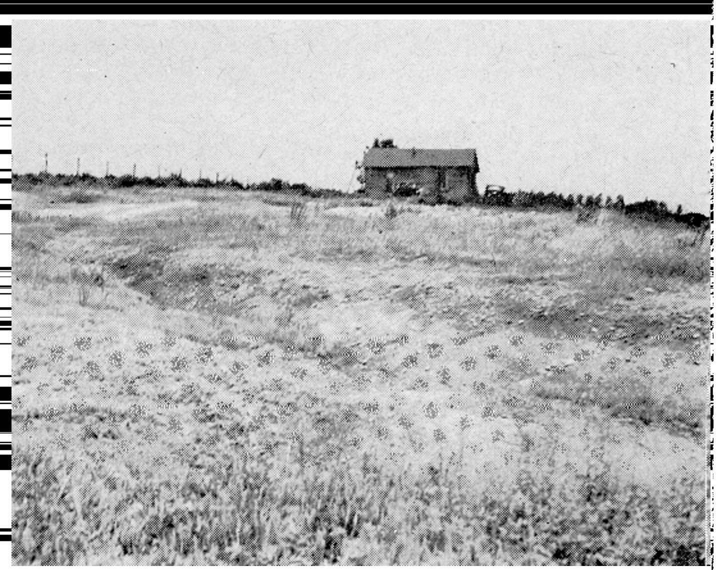
Nearly all of this soil is used. Sandstone and shale bedrock is at depths ranging from drained soils. The water table is within a foot of the

Profile description:

Use and suitability.—Practically all the acreage is still in cutover hardwood forest. The soil is suitable for cultivation and pasture because of its favorable tilth and good moisture relations. It is suited to many [illegible]

clay and, consequently, are droughty and difficult to work.

Use and suitability.—About 15 percent of the acreage is in cutover forest. The rest has been cleared and [illegible]



Use and suitability.—Most of this soil has been cleared and cultivated. It is now used mainly for cotton. Some of the acreage is idle or in pasture. Most of the acreage is now well managed.

Strong slopes and erosion limit the suitability and productivity of this soil. It is suited to many kinds of crops, including cotton, corn, small grains, and nearly all the legumes and grasses grown for hay and pasture. If carefully managed, conserved, and fertilized, the soil is capable of producing moderately high yields. It is in capability unit IVe-2.

Melvin Series

Melvin silt loam (Ma).—This poorly drained soil is on first bottoms and is forming from alluvium that originated chiefly from limestone. In most places the alluvium is mixed with material from shale and sandstone. The soil occurs along slow-flowing creeks flanked by broad smooth bottom lands. It is generally the first soil to be flooded. It occurs as fairly large areas in association with the Huntington and Lindside soils throughout the Tennessee and Moulton Valleys. It differs from the Prader soil in its uniform silty or silty clay loam texture.

Profile description:

0 to 3 inches, dark-brown silt loam.
3 to 12 inches, dark-brown silty clay loam mottled with gray and specks of reddish yellow.
12 to 36 inches, gray silty clay loam mottled with yellowish brown and specks of reddish yellow.

Limestone bedrock in most places is at depths of more than 5 feet. In a few places it is shallower and in some it is at the surface.

This soil is fairly high in plant nutrients and organic matter and neutral to slightly acid. A few areas may be slightly alkaline. The water table is at or above the surface during wet parts of the year, but it is within 1½ to 2 feet most of the time, especially during the dry season.

Use and suitability.—Parts of this soil have been cleared and used chiefly for pasture. Uncleared parts are in forest consisting mainly of gum, maple, elm, [illegible] willow, and water tol-

strong mottling and the compact or cemented fragipan characteristics in the B horizon of the moderately well drained Monongahela soils.

In this county soils of the Holston and Monongahela series occur in close association, are difficult to map separately, and were mapped together as undifferentiated units. These soils occur with the Etowah and Tyler soils. Holston and Monongahela soils are widely distributed over much of the Tennessee and the Moulton Valleys.

Monongahela and Holston fine sandy loams, undulating phases (Hh).—This mapping unit occupies gentle slopes. From 70 to 80 percent of the acreage has the moderately well drained profile of the Monongahela series, and the rest is Holston soil.

Profile description of Monongahela fine sandy loam:

0 to 5 inches, light yellowish-brown to pale-brown fine sandy loam.
5 to 20 inches, yellowish-brown to light yellowish-brown friable silt loam to fine sandy clay; friable.
20 to 34 inches, light yellowish-brown clay loam or silty clay loam (pan) mottled with gray and red; compact; breaks easily to angular fragments.
34 inches +, mottled, as layer above, but less compact.

Limestone bedrock is at depths ranging from 4 to 15 feet or more.

Profile description of Holston fine sandy loam:

0 to 6 inches, light yellowish-brown fine sandy loam.
6 to 30 inches, yellowish-brown fine sandy clay loam; friable.
30 to 42 inches +, yellowish-brown fine sandy clay loam or fine sandy clay mottled with gray and red; friable to firm.

Limestone bedrock is at depths ranging from 4 to 15 feet or more.

The surface layers of both the Monongahela and the Holston soils are from 10 to 12 inches thick, and their texture ranges to silt loam. The depth to the mottled of this mapping unit. Corn, small grains, grain sorghum, soybeans, and many kinds of legumes and grasses grown for hay and pasture are well suited. The areas

phases. The plow layer has good tilth. The Monongahela soil is inadequately drained for alfalfa and cotton.

Use and suitability.—Some of this soil is still in cut-the steeper Muskingum soils on adjacent lower slopes.

The 4- or 5-inch surface layer is a grayish-brown [redacted]

[redacted]

loam that breaks easily to weak subangular fragments ½ to 1¼ inches in diameter. Below the depth of 18 inches is a brownish-yellow or light-yellow fine sandy loam or loamy fine sand containing many partly dis-

This soil is poorly suited to crops or to pasture. It is in capability unit VIIe-1.

[redacted]

Soils of the Nolichucky series are loamy and well drained. They have formed on high stream terraces from a fairly uniformly thick old general alluvium that originated from sandstone, limestone, and shale. All of the acreage is in the northern one-third of the Tennessee Valley. The Nolichucky soils differ from the associated Etowah soils in having a lighter colored surface layer and a somewhat sandier subsoil. They differ from the associated Cumberland soils in having a much

[redacted]

grown crops, including alfalfa. It is in capability unit IIe-2.

Nolichucky fine sandy loam, eroded rolling phase (Na).—This soil differs from the eroded undulating phase of Nolichucky fine sandy loam chiefly in slope. It occupies slopes that range from 6 to 12 percent. It occurs with

Profile description:

0 to 6 inches, brown to reddish-brown silt loam.
6 to 14 inches, reddish-brown or dark reddish-brown heavy silt loam or silty clay loam.
14 to 30 inches +, mottled gray, brown, and yellowish-brown silty clay loam.

moisture. The water table is within 2 or 3 feet of the surface most of the year, but during the wet season it is at or near the surface. Internal drainage is good enough to allow the growing of crops that will tolerate some wetness. Corn is the chief crop, but cotton, soybeans, sorghum, and lespedeza are grown on some of the acreage. Small amounts of fertilizer are applied to cotton and, to some extent, to corn.

This soil is suitable for intensive use, but its slow drainage makes it unsuitable for alfalfa and usually for cotton. Its ample supply of moisture favors it for lespedeza and for legumes and grasses grown for pasture. It responds well to fertilization. Ooltewah fine sandy loam is in capability unit IIw-1.

Philo Series

Philo fine sandy loam (Pe).—This light-colored, moderately well drained soil is forming from general alluvium that washed from soils derived from acid sandstone and shale. Slopes are as much as 2 percent. The soil mainly occupies narrow bottom lands along streams

wide bottoms on which Philo soils occur. The nearly level surface favors the conservation of soil and moisture.

Use and suitability.—This soil is well suited to corn, hay, and pasture, but it is not suited to cotton, alfalfa, and other crops that require good drainage. The narrow bottom lands, subject to flash floods, are more suitable for improved pasture, woodland pasture, or forestry than for tilled crops. Fescue and ladino clover are good pasture plants if they are properly seeded and the soil is limed and adequately fertilized. This soil is in capability unit IIw-1.

Pottsville Series

The Pottsville series consists of light-colored skeletal soils that are shallow to bedrock. They have formed mainly in residuum from acid clay shale, acid sandy shale, or a mixture of these.

The sandy shale may have contained very thinly bedded, varicolored strata from 2 to 4 feet thick of indurated or partly indurated very fine sandstone, silt-

6 to 22 inches, reddish-yellow (7.5YR 6/6) shaly silty clay mottled with yellow, red, and gray; firm to moderately friable.

22 to 38 inches, pale-yellow (2.5Y 8/4) to very pale brown (10YR 7/3) partly weathered shaly silty clay or shaly clay mottled with red and gray; firm; very sticky and moderately plastic when wet, very hard when dry.

Pottsville shaly silt loam differs greatly from place to place because the various layers, colors, textures of the interbedded material in the parent rock may be near the surface or exposed at different levels on slopes. Shale predominates in the lower part of the weathered profile, however, and in the underlying parent material. The texture of the surface soil in a virgin profile ranges from fine sandy loam to silt loam, but usually this layer is fine textured. The thickness of the friable surface layer in virgin areas ranges from about 2 inches to as much as 8 inches, depending on the amount of sand and silt in the parent rock.

Where the thinly bedded varicolored layer of parent rock is exposed to weathering, small platy fragments about one-fourth inch thick and from less than one-half

lespedeza sericea. This soil is in capability unit VIe-2.

Pottsville shaly silt loam, steep phase (Pg).—This soil differs from the hilly phase mainly in slopes. Gradients range from 20 to more than 35 percent.

Use and suitability.—Nearly all the acreage is in cutover forest. Little of it has been cleared for cultivation. The best use of this soil is forestry. The percentage of pine in the forest can be increased by planting pine seedlings or by leaving more pine seed trees to reseed the cutover areas. Improved pastures have not been developed on any of the cleared acreage. This soil is in capability unit VIIe-1.

Prader Series

Prader silt loam (Ph).—This soil has formed from alluvium that washed from soils derived mainly from interbedded sandstone and shale, but also from sandstone, shale, and limestone. Prader silt loam occupies slopes that range from 0 to 2 percent. It occurs on fairly wide first bottoms, mainly in the limestone valleys and along streams that flow from the plateaus of Sand and Little Mountains or that receive runoff from colluvial slopes near the base of the mountains. The

The texture of the surface soil ranges from a fine sandy loam to a silt loam. The subsoil normally is a silty clay to silty clay loam, but in places it may be a sandy clay loam.

This soil is medium to strongly acid. It is difficult to work under natural conditions. However, in areas that are high enough to allow good outlets for surface drainage, the workability and tilth are usually fair to good. Moisture is easily absorbed. The capacity to hold

firm granules and fine subangular blocks; fairly hard when dry, sticky and plastic when wet; strongly acid.

4 to 26 inches, gray to dark-gray silty clay loam mottled with yellowish brown and brownish yellow; gradual transition to a stiff clay in the lower part; clay breaks to subangular fine blocks; hard when dry, sticky and plastic when wet; entire layer very strongly acid to strongly

Rockland

Rockland, limestone, rolling (Rb).—Generally 75 to 80 percent of the surface of this land type is covered by exposed rock, but in places 50 percent or more of the surface is occupied by Talbott and Colbert soil materials. The relief ranges from 6 to 12 percent, but some of the included ridgetops, narrow benches, and gentle slopes have gradients of 3 percent or less. The percentage of surface covered by exposed limestone rock increases with the gradient. The nearly rock free surfaces usually consist of narrow benches just above relatively steep limestone ledges. The ridgetops, although nearly level, usually are very stony, and some are cherty.

This land type occupies irregularly shaped areas containing from less than 5 acres to more than 60 acres. It occurs with other rockland and stony land types in the Moulton Valley and near the bases of Sand and Little Mountains. The soil material is similar to that of Stony rolling land, Talbott and Colbert soil materials. It is moderately productive when there is ample moisture, but it is droughty in summer and early in fall.

Use and suitability.—This land type is mostly in forest consisting of redcedar, redbud, black locust, plum, and briers, but in places the growth consists of hardwoods mixed with cedar and pine. The soil is nearly unsuitable for cultivation or improved pasture. Some of the less stony areas can be partly improved for pasture by clearing trees, underbrush, and briers to allow grasses and legumes a better chance. This land type is in capability unit VIIe-2.

Rockland, limestone, steep (Rc).—This miscellaneous land type consists of steep and rough rocky land not uniform in composition or relief. In places it consists almost entirely of large limestone boulders and exposures of limestone bedrock. It occurs as moderately low limestone bluffs, or as more or less regularly spaced ledges on slopes, or as ledges encircling limestone sinks. This land type is on the steep rocky slopes of Sand and Little Mountains and on the hilly and steep knobs in Moulton Valley.

The spaces, cracks, and crevices between the rocks and the holes in the rocks are filled or nearly filled by soil material accumulated through residual and colluvial action. This material weathered from limestone and shale and, in places, partly from sandstone. About 75 percent of the surface is exposed rock. Nevertheless, in many places, including those on fairly steep slopes, the surface layer consists of fairly deep deposits of colluvial or residual material derived mainly from limestone but modified by materials derived from shale, sandstone, or both.

Runoff is rapid and usually excessive, even in areas under forest. Internal drainage and aeration normally are slow because the material is shallow to bedrock and of fine texture. Seepage is fairly common near the bases of the stronger slopes.

Use and suitability.—This land type is mostly in cutover forest consisting of cedar, oak, hickory, locust, gum, and other hardwoods. Scattered pines occur areas covered more deeply with soil are fairly well suited to pine, but this land type generally is not good for pine. Some areas can be used as woodland pasture if they are partly cleared to allow grasses and legumes to grow. This land type is in capability unit VIIe-2.

Ruston Series

Soils of the Ruston series are sandy, well drained, and light colored. They occupy slopes ranging from 2 to about 16 percent but are mainly in the range of 5 to 10 percent. They have formed from unconsolidated sands and sandy clay loams in the upper part of the Coastal Plain formation. These sands and sandy clay loams range from less than 24 inches to about 60 inches in thickness; they cover the interbedded sandstone and shale of the Pottsville formation. The Coastal Plain formation caps the narrow ridges of Sand Mountain in the southwestern corner of the county, and, in that area, its total thickness is 8 or 9 feet in some places. These ridge crests covered by Coastal Plain materials are seldom more than a quarter of a mile wide and commonly only an eighth.

The parent material ranges in texture from gravel or coarse loamy sand to sandy clay loam; it usually contains quartzite gravel or coarse sand. The quartzite pebbles seldom exceed one-half inch in diameter.

All the Ruston soils are in the William B. Bankhead National Forest. They occur mainly with the Muskingum soils that were derived from the exposed interbedded sandstone and shale of the Pottsville formation that is exposed on lower slopes not covered by the Coastal Plain mantle.

Ruston soils have developed under forest consisting of red, white, post, and chestnut oaks, hickory, poplar, and shortleaf pine.

Ruston sandy loam, undulating phase (Rf).—This well drained to excessively drained soil occupies the wider ridge crests on which the mantle of Coastal Plain material is thicker than average. This soil is somewhat more typical of the Ruston soils that have developed in other counties from deep beds of unconsolidated sands and sandy clay loams of the Coastal Plain formation.

Profile in a virgin area:

0 to 8 inches, light yellowish-brown (10YR 6/4) to yellowish-brown (10YR 5/6) light sandy loam; very friable; material in lower part slightly sticky when wet; very strongly acid.

8 to 36 inches, yellowish-red (5YR 4/6 to 5/6) light sandy clay loam that is finer textured with depth; friable; moderately cohesive when moist, somewhat sticky when wet; very strongly acid.

36 to 48 inches, red sandy loam to loose loamy sand or sand, somewhat splotched or streaked with yellow and yellowish brown; very friable; slightly cemented when dry.

Coarse sand and small quartzite pebbles half an inch or less in diameter are fairly common throughout the profile. The surface soil ranges from loamy sand to light sandy loam. A dry surface in a cultivated area a clay shale at depths of 36 inches or less, the internal drainage in the lower subsoil is slow.

This soil is low in plant nutrients and organic matter and very strongly acid. It has good tilth and is easily worked. Moisture is readily absorbed. The soil is not

ested. In places parts of the subsoil are gone and shallow gullies have formed.

The 4- to 5-inch surface layer consists of the remaining original surface layer, which has been mixed with the upper subsoil during tillage. It is more brown or very fine sand streaked or mottled with gray; moderately loose; medium to strongly acid.

used for crops. Cotton has predominated in the Tennessee Valley, and corn and cotton were the main crops in the Moulton Valley. Minor crops are grown in both

Stony rolling land

Stony rolling land, Talbott and Colbert soil materials (Sd).—This miscellaneous land type is mainly in the Moulton Valley. It is near the bases of Sand and Little Mountains in association with limestone rocklands and with the Colbert, Hollywood, and Talbott soils. The mapping unit consists of limestone bedrock, large limestone boulders on the surface, and Talbott and Colbert soils or soil materials in the intervening spaces. The soil material ranges in thickness from 1 inch or less to 36 inches or more. It generally is shallow, except where it fills deep holes, cracks, and crevices in the limestone. Usually it thins near the ledges of bedrock, but it is deeper below the outcropping. There is little uniformity in the depth to bedrock or in the extent of its exposure at the surface. The relief is mainly rolling, but there are some gently rounded ridgetops,

sandstone is in relatively thin layers that alternate with thin and thick beds of shale. The sandstone overlies beds of limestone, but to great extent the overlying sandstone and shale materials have broken away. The boundaries shown on the map between this land type and Rockland, limestone, steep, are only approximately accurate.

This land type occurs on the steep slopes and bluffs of Sand and Little Mountains. It is associated closely with Muskingum and Pottsville soils and with Rockland, limestone, steep, which frequently borders it on the lower side.

The runoff is very rapid in all areas, including those forested. The internal drainage ranges from moderately rapid to very rapid in most areas, but it may be fairly slow in places, especially on the benches where seepage keeps the water table fairly high. The native vegetation consists of hardwoods and pine mixed in from argillaceous limestone and shale usually are more uniform and finer in texture than soils derived from parent material that was modified by cherty or sandy materials. Talbott soils usually are free of chert or limestone fragments, but scattered chert is fairly common in some areas, and there are some very cherty spots. Limestone boulders and bedrock are exposed in places, especially in the eroded areas.

Talbott silt loam is moderately high in natural fertility and strongly acid. It is fairly easy to work, has good tilth, and has a moderate to low capacity to hold moisture that plants can use. Internal drainage is medium in the surface and upper subsoil and moderately slow in the lower subsoil. The soil responds to management but less so as the damage from erosion becomes more severe.

Use and suitability.—Nearly all of this soil is in cutover forest and has been damaged little through accelerated erosion. The soil is suitable for most of the farm crops commonly grown. The virgin soil is fairly productive, but it needs mineral fertilizer for satisfactory yields if cropped continuously. This soil is in capability unit IIIe-12.

Talbott silty clay loam, eroded undulating phase (Tf).—This soil, the most extensive of the Talbott soils, differs from the undulating phase of Talbott silt loam in erosion. It occupies slopes that range from 2 to 6 percent and occurs as areas containing from a few to more than 100 acres. It is mainly in the Moulton Valley, but a few areas are in the Tennessee Valley.

From about 50 to more than 75 percent of the original surface soil and subsurface materials have been lost through erosion. In places part of the upper subsoil has also been lost. The 4- or 5-inch surface layer consists of the remaining friable original surface soil and the upper subsoil that has been mixed with it during tillage. The present surface layer is finer in texture and redder in color than the original surface soil.

The runoff from cropland ranges from medium to moderately rapid, but it is very rapid if not controlled. The internal drainage is medium in the surface soil

the side dressing of nitrogen is omitted. This soil is in capability unit IIIe-12.

Talbott silty clay loam, eroded rolling phase (Te).—This soil differs from the eroded undulating phase of Talbott silty clay loam in slope, shallowness, and erosion. Slopes range from 6 to 12 percent. The 4- or 5-inch surface layer is somewhat more red because a greater percentage of subsoil has been mixed with it in tillage.

A small acreage has more chert on the surface and in the soil than the typical soil. The chert somewhat interferes with tillage but does not prevent it. In places limestone boulders and bedrock are on the surface.

The stronger slopes and greater loss of surface soil have made workability, tilth, and the capacity to absorb moisture somewhat less favorable than for the undulating phase of Talbott silt loam. Erosion has made conservation and reclamation of this soil more difficult and has increased its tendency to erode. The light, stiff clay subsoil, now part of the plow layer, is not easily improved to the point where it is good surface soil.

This soil responds fairly well to management if runoff is adequately controlled and winter legumes are turned under as green manure. Conservation was more easily accomplished before the friable surface soil was lost.

Use and suitability.—Nearly all of this soil has been used for row crops, mainly cotton or corn. Less than 10 percent is in forest. This soil is suitable for row crops grown in long rotations. It is also good for sericea lespedeza grown for hay or pasture. If the soil is used mainly for row crops, strict conservation practices must be applied if productivity is maintained. This soil is in capability unit IVe-12.

Talbott silty clay, severely eroded undulating phase (Td).—This soil differs from the eroded undulating phase of Talbott silty clay loam in having lost nearly all of the original surface soil and subsurface layer through erosion. It occupies slopes that range from most of the acreage is not suitable for crops and is of

silt loam, but the amount of pine probably was a little

Use and suitability.—Nearly all of this soil is used each year for row crops or as unimproved pasture. Little of the acreage has been put in improved permanent pasture. Winter legumes, Italian ryegrass, and small grains seeded late in summer or early in fall furnish some grazing. This soil is suitable for nearly all of the crops commonly grown in the county. The soil is fairly erosive, however, and must be protected by [illegible]

all soluble carbonates. When in cultivation, it is easy to work and has excellent tilth. Moisture is readily absorbed whether the soil is in forest or in cultivation. The capacity to hold available moisture is moderate. Crops respond well to complete mineral fertilizer and to additions of organic matter.

Use and suitability.—This soil is mainly in cutover forest. It is well suited to pine. The present forest [illegible] representing the Soil Conservation Service. This soil is in capability unit IIe-3.

Tilsit silt loam, rolling phase (Tl).—This soil differs from the undulating phase of Tilsit silt loam mainly in slopes. In addition, its semihard mottled zone is less definitely developed. The soil occupies slopes ranging from 5 to about 10 percent on Little Mountain. Bedrock or partly weathered interstratified sandstone and shale is at depths ranging from 18 to about 48 inches. The deepest soil commonly occurs near the base of slopes and contains some colluvium.

This soil is not difficult to work, but it is harder to work on these stronger slopes than on the undulating phase. The soil is more erosive than the undulating phase, particularly as cropland, and requires more strict practices for tillage and for the conservation of soil and moisture.

Runoff in forests is medium to moderately rapid. It becomes moderately rapid to rapid on cropland, unless adequate conservation of soil and moisture is practiced. Internal drainage is medium in the surface soil and upper subsoil and normally slow in the lower subsoil and the parent material.

Use and suitability.—Most of this soil is in cutover forest consisting of hardwoods and pine. The percentage of pine is probably greater than that in virgin forests because pine generally reseeds better and grows more rapidly than the hardwoods. If the soil is cleared and improved as cropland, the use suitability is about the same as for Tilsit silt loam, eroded rolling phase. Tilsit silt loam, rolling phase, is in capability unit IIIe-3.

Tilsit silt loam, eroded rolling phase (Th).—This eroded

grown in long or moderately long rotations that include close-growing crops. Lespedeza sericea is the most suitable close-growing plant for hay and pasture. This soil is in capability unit IIIe-3.

Tupelo Series

Soils of the Tupelo series are light colored and poorly to somewhat poorly drained. They are forming from old alluvium that washed from soils derived mainly from clayey limestone or alluvium that washed from weathered exposed limestone and shale and was modified in places by material from sandstone.

Tupelo soils occupy low terraces and are scattered widely throughout the Moulton and Tennessee Valleys. Slopes range from 0 to more than 2 percent but seldom exceed 1 percent. Near the margin of terraces or the border of swales, however, the gradients are stronger. Tupelo soils occur with Colbert, Talbott, Hollywood, Robertsville, Dunning, and Melvin soils and with other soils of the limestone valleys.

The natural vegetation consists mainly of post, water, and white oaks, hickory, persimmon, sweetgum, blackgum, elm, dogwood, and a few scattered pines and cedars. In cutover areas pine and cedar are more common.

Tupelo silt loam (To).—This soil is slightly better drained than other Tupelo soils.

Profile in a virgin area:

0 to 5 inches, light yellowish-brown silt loam to silty clay loam faintly splotched with yellow and brown; upper ½ to 1 inch contains organic matter and is a dark grayish brown to brown;

is moderate to low, but it is reduced by the lack of a friable subsoil.

Runoff is slow to moderately slow in most areas, but it is good in some. Freshly plowed or clean-cultivated fields tend to erode easily because the surface layer becomes saturated and cannot drain. Internal drainage

The surface soil and, in places, the upper subsoil are moderately well drained. Over the acreage as a whole, drainage is moderately slow in the upper subsoil and very slow in the lower subsoil and underlying light clayey material.

Tupelo loam is moderately low in plant nutrients clay loam to silty clay loam mottled with brownish yellow and gray; strongly acid.

Bedrock is at depths of 4 to 20 feet.

The texture of the surface soil ranges from fine sandy loam to silt loam. Depths to the mottled layer range from 8 to 15 inches. Large amounts of very fine sand are common, and in places large amounts of silt are in the soil.

Use and suitability.—A large part of this soil is in forest consisting of hardwoods mixed with pine. The cleared acreage has been used mainly for corn, soybeans, grain sorghum, hay, and pasture. Artificial drainage is needed for crops and pasture. The soil is suited best to grain sorghum, soybeans, and corn, and it is well suited to improved pasture. The soil is easily tilled and the response to fertilizer is good. It is in capability unit IIIw-2.

Tyler and Monongahela Soils

Tyler and Monongahela fine sandy loams occurring as irregular and indefinite mixtures are mapped together as undifferentiated units. The two soils resemble and blend with each other, and mapping them separately was not practical. The Monongahela soils are moderately well drained, and the Tyler are somewhat poorly drained.

Tyler and Monongahela fine sandy loams, level phases (Mc).—In this mapping unit, each soil occupies about

quate drainage, ranges from 8 inches to about 22 inches.

This mapping unit of Tyler and Monongahela soils is low in organic matter and plant nutrients and is strongly acid. It has a moderate capacity to hold moisture available for plants. The surface soil and upper subsoil are permeable, but, in much of the acreage, the pan is sufficiently developed to interfere materially with percolation of water and growth of roots. Areas that have a strongly developed pan tend to be droughty late in the growing season because plant roots do not penetrate the pan to obtain the moisture available deeper in the soil. The plow layer in most places has good tilth, but preparation of seedbeds and the planting of crops in spring are commonly delayed by prolonged wetness.

Use and suitability.—About 90 percent of this mapping unit has been cleared. Much of it is used for pasture, but part is used mainly for corn, grain sorghum, soybeans, and common lespedeza. A small part of the better drained acreage is used for cotton. A small acreage of winter cover crops is turned under as green manure. Moderate quantities of fertilizer are used, mainly on row crops.

These soils respond to fertilizers and can be used intensively. Nevertheless, runoff and slow internal drainage reduce yields, interfere with fieldwork, and limit the crops that can be grown. Artificial drainage could improve the soils for crops and pasture. The soils in this mapping unit are in capability unit IIIw-2.

loam to fine sandy clay. In the Tyler the underlying material is mottled light yellowish-brown clay loam or silty clay loam. On the stronger slopes, subsoil is exposed in a few places.

These soils are low in plant nutrients and organic matter and medium to strongly acid. The plow layer has fairly good tilth, except on the more eroded slopes where the soils are somewhat plastic when wet and hard when dry. The soils are somewhat poorly drained to moderately well drained. Like the soils in other Tyler and Monongahela mapping units, these soils are cold and slow in drying out for cultivation in spring or following rains.

Use and suitability.—All of this mapping unit has been cleared and cultivated. Much of it is now used for crops or permanent pasture. Corn, sorghum, soybeans, and lespedeza are among the more common crops. Some of the better drained parts are in cotton. Crops are fertilized to some extent, but productivity is not high. A small acreage is used for winter cover crops.

silty clay to silty clay loam; firm but friable; very strongly acid.

42 to 54 inches, dark-red silty clay or heavy silty clay loam with splotches or streaks of yellowish red; friable; very strongly acid.

The surface soil ranges from very dark brown to brownish yellow. The combined thickness of the relatively loose, friable surface soil and subsurface layers depends somewhat on erosion losses, but it ranges from less than 4 inches to about 15 inches. Small fragments of chert and round quartz gravel are fairly common on the surface and in the soil. These fragments do not noticeably interfere with tillage.

This soil is slightly acid to neutral. Erosion has impaired its workability, tilth, and ability to absorb moisture. It has a friable to moderately friable subsoil and can be restored to good tilth and productivity through proper management. It needs additional organic matter, which can be supplied by growing winter legumes for green manure and applying large quantities of complete fertilizer. The soil is susceptible lespedeza sericea. The pasture can be rotated occasionally with cotton, corn, or other row crops.

Areas shallow to chert or other bedrock or areas where runoff and erosion cannot be prevented should be used for forestry. This soil is in capability unit IVe-2.

Genesis, Morphology, and Classification of Soils

The purpose of this section is to present the outstanding morphologic characteristics of the soils of Lawrence County and to relate them to the factors of soil formation. Physical and chemical data are limited for these soils, and the discussion of soil genesis and morphology is correspondingly incomplete. The first part of the section deals with the environment of the soils; the second, deals with specific soil series and the

transported by water or gravity and laid down as unconsolidated deposits of clay, silt, sand, and large rock fragments.

The parent materials formed in place consist chiefly of residuum from the weathering of limestone, sandstone, and shale. The character of these materials is revealed by the properties of the soils that developed from them. The rock formations belong to the Pennsylvanian and Mississippian series of the Carboniferous System (*1*). These formations were laid down as unconsolidated sediments that gradually became consolidated rocks. This rocky stratum has not been folded or faulted by heat or pressure; it lies almost horizontal but has a slight dip to the south and southwest.

The Decatur and Dewey soils were formed chiefly from weathered high-grade limestone of the Warsaw and St. Louis or Tuscumbia (restricted) formations. The Talbott, Colbert, and Dowellton soils in the Tennessee and Moulton Valleys were formed from clayey lime-

Plant and animal life

Higher plants, micro-organisms, earthworms, insects, and other forms of life live on and in the soil and

rocks have contributed indirectly to the character of some soils through relief.

The internal drainage of many soils of the nearly is medium to strongly or very strongly acid throughout the solum. In general, the quantity of silt decreases and the content of clay increases with depth. The colloidal content of the B horizon is much higher than in the A_2.

In areas where the parent materials have been in place only a short time, as, for example, recently transported materials, the soils have poorly defined or no genetic horizons. Such soils are young and have few or none of the characteristics of zonal soils. They are, therefore, called azonal soils. Azonal soils are members of a second class of the highest category of soil classification. They are defined as a group of soils that do not have well-developed soil characteristics because their youth or condition of parent material or relief prevent the development of normal soil profile characteristics. (*8*).

The azonal soils are characterized by A_1 horizons that are moderately dark to very dark and apparently moderately to fairly high in amount of organic matter; by the absence of a zone of illuviation, or B horizon; and by parent material that is usually lighter than the A_1 horizon in color and similar to, lighter than, or heavier than the A_1 horizon in texture. They may be referred to as A–C soils because of the absence of a B horizon.

On some hilly and steep areas where a relatively small amount of water percolates through the soil and a large amount runs off rapidly, geologic erosion is relatively rapid and the soils are young. The materials are constantly renewed or mixed, and the changes brought about by vegetation and climate may be so slight that the soils are essentially A–C soils. These soils are also azonal soils.

In some nearly level areas where both internal and external drainage are restricted or where geologic erosion is very slow, soils whose materials have been in place a long time have certain well-developed profile characteristics that zonal soils do not have. Such soils are associated geographically with the zonal soils and are called intrazonal soils. They are defined as soils with more or less well-developed soil characteristics that reflect the dominating influence of some local factor of relief, parent material, or age over the normal effects of climate and vegetation (*8*). The properties of such soils in this area are generally the result of level relief influenced greatly by the character of the parent material and the kinds of vegetation that grow in such environment.

Soils of each of the three orders—zonal, azonal, and intrazonal—may be derived from similar kinds of parent materials. Within any one of those classes in this county, major differences among soils appear to be closely related to differences in the kind of parent material. The thickness of soils over the rock from which they were derived is partly determined by the

TABLE 4.—*Soil series classified according to order and great soil group, and some factors that have contributed to their morphology*

ZONAL

Great soil groups and series	Parent material	Slope	Degree of horizon differentiation	Drainage
Red-Yellow Podzolic:				
Allen	Colluvium from sandstone and shale; some limestone	Undulating to hilly	High	Good.
Baxter	Weathered cherty limestone	Undulating to rolling	High	Good.
Dewey	Weathered high-grade limestone with some chert	Undulating to rolling	High	Good.
Etowah	General alluvium chiefly from limestone; some shale and sandstone.	Undulating to rolling	Medium	Good.
Linker	Weathered sandstone; some shale	Undulating to hilly	High	Good.
Nolichucky	General alluvium from sandstone and shale; some limestone.	Undulating to rolling	High	Good.
Ruston	Unconsolidated acid sandy Coastal Plain formation	Undulating to rolling	High	Somewhat excessive.
Sequatchie	General alluvium from sandstone and shale; some limestone.	Nearly level to undulating.	Low to medium	Somewhat excessive.
Talbott	Weathered argillaceous limestone; occasional chert	Undulating to hilly	High	Moderately good to good.
Waynesboro	General alluvium from sandstone and shale; some limestone.	Undulating to rolling	High	Good.
Colbert [1]	Weathered argillaceous limestone	Level to hilly	Medium	Moderately good.
Enders	Weathered interbedded acid sandstone and shale	Undulating to rolling	High	Moderately good to good.
Hartsells	Weathered interbedded sandstone and shale	Undulating to rolling	Medium	Good.
Holston	General alluvium from sandstone and shale; some limestone.	Undulating to rolling	High	Good.
Jefferson	Colluvium from sandstone and shale; some limestone	Undulating to hilly	High	Good.
Tilsit	Weathered interbedded fine-grained sandstone and shale.	Undulating to rolling	Very high	Moderately good.
Monongahela	General alluvium from sandstone and shale; some limestone.	Nearly level to undulating.	Very high	Moderately good.
Reddish-Brown Lateritic:				
Cumberland	General alluvium chiefly from limestone; some from shale and sandstone.	Undulating to rolling	High	Good.
Decatur	Weathered high-grade limestone [2]	Undulating to rolling	High	Good.

TABLE 4.—*Soil series classified according to order and great soil group, and some factors that have contributed to their morphology*—Continued

INTRAZONAL

Great soil groups and series	Parent material	Slope	Degree of horizon differentiation	Drainage
Rendzina:				
Hollywood	Thin colluvium or alluvium from argillaceous limestone.	Nearly level to gently sloping.	Medium	Somewhat poor to moderately good.
Humic Gley:				
Dunning	Young general alluvium from agrillaceous limestone	Nearly level to gently sloping.	Medium	Poor to very poor.
Low-Humic Gley:				
Dowellton	Weathered argillaceous limestone	Nearly level to gently undulating.	Medium	Somewhat poor.
Melvin	General alluvium chiefly from limestone	Nearly level	Medium	Poor.
Prader	General alluvium from sandstone, shale, and limestone	Nearly level	Medium	Poor.
Atkins	General alluvium from acid sandstone and shale	Nearly level	Medium	Poor.
Planosol (fragipan):				
Lickdale	Weathered interbedded fine-grained acid sandstone and shale.	Nearly level to gently sloping.	High	Very poor.
Robertsville	Old general alluvium, chiefly from limestone	Nearly level	High	Poor.
Johnsburg	Weathered interbedded fine-grained acid sandstone and shale.	Gently sloping	High	Somewhat poor.
Lawrence	Weathered limestone	Nearly level to gently undulating.	High	Somewhat poor.
Tupelo	Old general alluvium, chiefly from argillaceous limestone; some shale and sandstone.	Nearly level to gently undulating.	High	Poor to somewhat poor.
Tyler	Old general alluvium, chiefly from sandstone and [illegible]	Nearly level to gently [illegible]	High	[illegible]

Zonal soils

In this county, the zonal order is subdivided into the Red-Yellow Podzolic and the Reddish-Brown Lateritic great soil groups.

RED-YELLOW PODZOLIC SOILS

Red-Yellow Podzolic soils are a group of well-developed, well-drained acid soils having thin organic (A_0) and organic-mineral (A_1) horizons over a light-colored, bleached (A_2) horizon, over a red, yellowish-red, or yellow and more clayey (B) horizon. Parent materials are all more or less siliceous. Coarse reticulate streaks or mottles of red, yellow, brown, and light gray are characteristic of deep horizons of Red-Yellow Podzolic soils where parent materials are thick. Soils of this group developed under a deciduous or mixed forest in a warm-temperate moist climate (*7*, *8*). The soil-forming processes involved in their development are laterization and podzolization.

Members of this great soil group that have predomi-

Numerous small fragments of sandstone occur throughout the profile.

Baxter series

Soils of the Baxter series have developed from the residuum of weathered cherty limestone. They have a thin A_1, a prominent A_2, and a well-developed B horizon. Chert in amounts that interfere with cultivation is common throughout the profile. Baxter soils are medium to strongly acid and have a small amount of plant nutrients. There is less organic matter in the A horizon than in those of the Decatur or Cumberland soils.

A representative profile of Baxter cherty silt loam in a cultivated area:

A_1 0 to 3 inches, yellowish-brown (10YR 5/4) cherty silt loam; a moderate amount of of organic matter; friable.

A_2 3 to 10 inches, yellowish-brown (10YR 5/4)

Etowah series

Soils of the Etowah series have formed from general alluvium that washed from high-grade limestone and was deposited on stream terraces. They are characteristically well drained, but as mapped in Lawrence County, they include much acreage that has a weak to moderate fragipan at a depth of about 26 inches. They are medium acid, have a moderately large amount of plant nutrients, and are permeable to roots and moisture. Their surfaces are nearly level to rolling.

The Etowah profile is not so strongly developed as that of the Cumberland soils. In addition, the colors of the A_2 and the B layers do not contrast so much as in the Cumberland, and the structure of the B layer is not as strong. The A layer of the Etowah soils is less brown than that of the Cumberland soils, and the B layer generally contains less clay. Etowah soils differ from the Waynesboro and Nolichucky soils in containing less sand. The surface layer of the Etowah is browner than that of the Nolichucky, and the subsoil generally is less red than that of the Waynesboro. The fragipan common in some of the Etowah soils is not so strongly developed as it is in the Captina soil (not mapped in Lawrence County), and the surface layer generally is browner.

Representative profile of Etowah silt loam:

A_1 0 to 2 inches, very dark grayish brown (10YR 3/2) smooth silt loam; large amount of organic matter.

A_2 2 to 6 inches, dark-brown (7.5YR 4/4) smooth silt loam; moderate in content or organic matter.

supply of plant nutrients and organic matter. Linker soils differ from the Hartsells soils in having a more strongly developed and redder B horizon. The B horizon in the Hartsells soils is yellow.

Representative profile of Linker fine sandy loam:

A_1 0 to ½ inch, very dark grayish-brown (10YR 3/2) fine sandy loam; large amount of organic matter.

A_2 ½ to 5 inches, light yellowish-brown (10YR 6/4) fine sandy loam splotched with organic matter.

B_1 5 to 8 inches, yellowish-brown (10YR 5/6) very fine sandy loam to silt loam; friable.

B_2 8 to 14 inches, brown to strong-brown (7.5YR 5/4 to 5/6) fine sandy clay loam to clay loam; friable.

B_3 14 to 30 inches, yellowish-red to red (5YR 5/6 to 2..5YR 4/6) fine sandy clay loam or fine sandy clay; friable.

C 30 to 42 inches, red (2.5YR 4/6) and brownish-yellow (10YR 6/6) partly weathered sandstone parent material that ranges in texture from sandy clay loam to fine sandy loam.

Nolichucky series

Soils of the Nolichucky series have developed from parent materials that are similar to those of the Waynesboro soils, except that the influence of limestone was less. In addition, they have weathered under the same type of climate and on similar relief. The A horizon was lighter in color and was thicker in virgin horizon has a clear boundary with the distinctly reddish, strongly acid, finer textured B horizon. The base-exchange capacity of the B horizon is not high, and base saturation is low.

The original forest on the Ruston soils was less luxuriant than on Cumberland, Dewey, and similar soils. It probably resembled the present forest of red and chestnut oaks, hickory, and Virginia pine. The total area of Ruston soils is small, and all of it is on the uplands in the extreme southwestern part of the county.

Profile of Ruston sandy loam in an undisturbed area:

- A_1 0 to 1 inch, light brownish-gray (10YR 6/2) sandy loam; loose organic matter in moderate amounts.

uncommon. The surfaces of most Talbott soils are undulating to rolling, but some are hilly. Talbott soils are medium to strongly acid and contain a moderate amount of organic matter and plant nutrients. The solum is not so deep as those of Decatur and Dewey soils, but the subsoil is more plastic and sticky.

Representative profile of Talbott silt loam:

- A_1 0 to 2 inches, grayish-brown (10YR 5/2) silt loam; smooth; organic matter in moderate amounts.
- A_2 2 to 6 inches, yellowish-red (5YR 5/6) silt loam splotched with organic matter; friable.
- B_1 6 to 13 inches, red (2.5YR 4/8) silty clay loam to silty clay; moderately friable.
- B_2 13 to 21 inches, red (2.5YR 4/6) heavy silty

chucky soils. Colbert soils lack strong profile development because of extremely fine texture, slow permeability, and geologic erosion that keeps pace with the weathering of the parent rock. The profiles are very nearly skeletal on the stronger slopes. Colbert soils are predominantly medium to strongly acid and low in bases. The base-exchange capacity is thought to be fairly high.

Representative profile of Colbert silt loam, undulating phase, in an undisturbed area:

- A_1 0 to 2 inches, dark grayish-brown (10YR 4/2) silt loam; moderate amount of organic matter.
- A_2 2 to 6 inches, light yellowish-brown (10YR 6/4) silt loam splotched with organic matter; friable.
- B_1 6 to 12 inches, brownish-yellow (10YR 6/6) silty clay loam; friable; moderate medium subangular blocky structure.
- B_2 12 to 22 inches, brownish-yellow (10YR 6/6) clay weakly mottled with gray (10YR 5/1) and brown (7.5YR 5/4); sticky and plastic when wet, hard when dry; fragments are [illegible] dense silty clay; strong medium subangular blocky structure.
- C_1 20 to 36 inches, strong-brown (7.5YR 5/8), tough, dense silty clay to clay mottled with pale yellow (2.5Y 7/4) and red (2.5YR 5/8); structure weaker than in B_2 layer and fragments are larger and more angular.
- C_2 36 to 46 inches, mottled red (2.5YR 5/6), gray (7.5YR 5/0), and pale-yellow (2.5Y 7/4) clay, partly weathered shale, and thinly interbedded sandstone materials.

Small platy sandstone fragments occur throughout the profile.

Hartsells series

Soils of the Hartsells series have developed from residuum of acid sandstone and interbedded sandstone and shale. The soils are strongly acid and low in plant nutrients, organic matter, and bases. The genetic horizons do not show strong contrasts in color and texture, and the structure has not been strongly developed. Hartsells soils are not extensive. They occupy a few undulating to rolling areas on the broader parts of narrow ridges in the southern part of the

A_1 0 to 1 inch, very dark grayish-brown (10YR 3/2) fine sandy loam; high content of organic matter.

A_2 1 to 11 inches, brown (10YR 5/3) to yellowish-brown (10YR 5/6) fine sandy loam.

B_1 11 to 22 inches, strong-brown (7.5YR 5/6) fine sandy clay loam; weak to moderate medium subangular blocky structure; friable.

B_2 22 to 34 inches, yellowish-brown (10YR 5/8) fine sandy clay; moderate medium subangular blocky structure; friable.

C 34 to 42 inches, yellowish-brown (10YR 5/8) moderately compact fine sandy clay mottled with gray (10YR 5/1) and red (2.5YR 4/6); friable.

Limestone bedrock is generally at depths ranging from 3 to 15 feet.

Jefferson series

Soils of the Jefferson series were developed in colluvium chiefly from acid sandstone and shale. Limestone commonly outcrops on the lower slopes, so it appears likely that the Jefferson soils have been influenced by limestone residuum or at least by lime-bearing water. Most areas of Jefferson soils are underlain by limestone, generally at a depth of 3 to 8 feet. Jefferson soils are morphologically like the Holston soils and have about the same genetic background as the Allen soils. The Allen soils, however, have been more strongly influenced by limestone, and some areas have developed under better drainage conditions.

Representative profile of Jefferson fine sandy loam in an undisturbed area:

A_1 0 to ½ inch, dark-gray (10YR 4/1) fine sandy loam; large amount of organic matter.

A_2 ½ to 6 inches, pale-brown (10YR 6/3) fine sandy loam splotched with organic matter; loose.

A_3 6 to 15 inches, light yellowish-brown (10YR 6/4) fine sandy loam; weak medium subangular blocky structure; friable.

B_1 15 to 26 inches, yellowish-brown (10YR 5/8) fine sandy clay; moderate medium subangular blocky structure; friable.

B_2 26 to 36 inches, reddish-yellow (7.5YR 6/8) fine sandy clay; friable.

C 36 to 45 inches, reddish-yellow (7.5YR 6/8) fine sandy clay mottled with reddish brown (2.5YR 4/4) and gray (10YR 6/1); friable.

Tilsit series

Soils of the Tilsit series are an intergrade from the Red-Yellow Podzolic toward the fragipan subdivision of the Planosol group. They have developed from residuum of interbedded fine-grained sandstone and shale. The Tilsit soils have A and B horizons characteristic of Red-Yellow Podzolic soils, but below the B_2 layer is a compact, brittle, finely mottled fragipan. This layer in Tilsit soils is distinguished from a clay-

Tilsit soils occupy the less sloping broad ridge lands. They are medium to strongly acid and low in supply of organic matter and bases. The B_2 layer is permeable, but the fragipan is hard and resists penetration of roots and moisture until thoroughly moistened.

Representative profile of Tilsit silt loam in an undisturbed area:

A_1 0 to 1 inch, dark grayish-brown (10YR 4/2), mellow, smooth silt loam; amount of organic matter moderate.

A_2 1 to 7 inches, yellowish-brown (10YR 5/4), smooth silt loam splotched with organic matter; moderate medium crumb structure.

B_1 7 to 15 inches, yellowish-brown (10YR 5/6) fine sandy clay loam; weak to moderate medium subangular blocky structure; friable.

B_2 15 to 24 inches, dark yellowish-brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable.

C_1 24 to 34 inches, yellowish-brown (10YR 5/4) silty clay to silty clay loam mottled with gray (10YR 5/1) and red (2.5YR 4/6); crumbles to fine angular fragments; firm in place, and hard and brittle when dry.

C_2 34 to 46 inches, mottled gray (10YR 5/1) and yellowish-brown (10YR 5/4) silty clay splotched with red (2.5YR 4/6); breaks into angular fragments under pressure; very hard and compact.

Bedrock shale is at a depth of 46 inches.

Monongahela series

Monongahela soils resemble the Tilsit soils, except that generally the fragipan is a little more strongly developed. They have developed from moderately old to old general alluvium that washed mainly from sandstone and shale and to some extent from limestone. They are associated with the less well-drained Tyler and Tupelo soils and with small areas of the better drained Holston soils. All Monongahela soils in the county were mapped with Holston and with Tyler soils as undifferentiated units.

Representative profile of Monongahela fine sandy loam:

A_1 0 to 1 inch, very dark grayish-brown (10YR 3/2) fine sandy loam; moderate amount of organic matter.

A_2 1 to 5 inches, grayish-brown (10YR 5/2) to pale-brown (10YR 6/3) fine sandy loam; moderate medium crumb structure; friable.

B_1 5 to 11 inches, yellowish-brown (10YR 5/4) silt loam; friable.

B_2 11 to 20 inches, light yellowish-brown (10YR 6/4) fine sandy clay; a few gray splotches in lower part; friable.

C 20 to 34 inches, light yellowish-brown (10YR 6/4) compact silty clay loam mottled with

REDDISH-BROWN LATERITIC SOILS

Reddish-Brown Lateritic soils have a dark reddish-

and have a moderately large amount of organic matter and plant nutrients. The Cumberland soils have prostructure less pronounced than in B_{22} layer; firm.

C 60 inches +, lighter red clay; some yellowish splotches; firm to very firm.

Bedrock limestone is at depths ranging from 5 to 20 feet.

Intrazonal soils

In this county the intrazonal order consists of the Rendzina, Humic Gley, Low-Humic Gley, and Planosols great soil groups.

RENDZINA SOILS

Rendzina soils are an intrazonal group of soils, usually with brown or black friable surface horizons underlain by light-gray or yellowish calcareous material. They have developed under grass vegetation, or mixed grasses and forest, in humid and semiarid regions, and from relatively soft, highly calcareous parent materials *(8)*. Rendzina soils have formed where there is excessive water part of the time. Poor aeration and the lack of an acid condition are probably responsible for the higher content of organic matter than is common to the associated soils.

Hollywood series

Soils of the Hollywood series have developed in a thin layer of colluvium or local alluvium originating from argillaceous limestone. They occupy nearly level to gentle valley slopes and are underlain by plastic clay residuum from limestone. Bedrock limestone is at depths ranging from 1 to 5 feet. Although the soil is classed as a Rendzina, its underlying bedrock is not soft, and its drainage is somewhat better than poor. The soil is slightly acid to alkaline. Soil structure is not well developed. The base-exchange capacity is high, and the degree of saturation with bases is probably high.

A representative profile of a Hollywood silty clay follows:

A_1 0 to 5 inches, very dark gray (2.5YR 3/0) to black (2.5YR 2/0) silty clay; sticky and plastic when wet but cracks upon drying.

A_2 5 to 20 inches, black (2.5YR 2/0) clay; mass breaks into angular fragments; sticky and plastic when wet, hard when dry.

B_2 20 to 28 inches, dark-gray (2.5YR 4/0) clay;

Dunning series

Soils of the Dunning series have developed in young general alluvium that originated mainly from argillaceous limestone. They are poorly to very poorly drained. These soils are slightly acid to alkaline. They are high in clay, noticeably dark in the upper part, and gray or mottled in the lower part at depths ranging from 6 to 20 inches. They have developed little structure. The chief soil-forming processes evident in the profile are the accumulation of organic matter in the upper part and gleization in the lower part. The base-exchange capacity is high, and apparently the degree of saturation with bases is also high.

Representative profile of Dunning silty clay:

A_{11} 0 to 4 inches, dark-gray (10YR 4/1) silty clay; sticky and plastic.

A_{12} 4 to 10 inches, very dark gray (10YR 3/1) silty clay to clay; little soil structure evident; dense, extremely plastic.

A_{1g} 10 to 15 inches, very dark gray (10YR 3/1) clay mottled with yellowish brown (10YR 5/6); little soil structure evident; heavy, sticky, and plastic.

C_g 15 to 36 inches, gray (10YR 5/1) clay mottled with yellowish brown (10YR 5/6); heavy and waxy; numerous brown concretions throughout the profile.

Bedrock limestone is at depths ranging from 3 to 6 feet.

LOW-HUMIC GLEY SOILS

Low-Humic Gley soils are an intrazonal group of imperfectly to poorly drained soils with very thin surface horizons, moderately high in organic matter, over mottled gray and brown gleylike mineral horizons with a low degree of textural differentiation. They range in texture from sand to clay. The parent materials vary widely in physical and chemical properties. A large proportion of them range from medium to strongly acid *(7)*.

Dowellton series

Soils of the Dowellton series have developed from weathered, highly argillaceous limestone. The A_1 horizon is thin and weakly developed, the A_2 is absent, and the B is very weakly developed. Argillaceous limestone bedrock is at a maximum depth of 3½ feet; there are

Melvin, Prader, and Atkins series

Soils of these three series have developed in young general alluvium that is subject to overflow. They are alike in having small to moderate amounts of organic matter in the surface layer, no B horizon, and strong gleization below the surface layer.

Melvin soils consist of material that originated chiefly from limestone. They range in texture principally from silt loam to silty clay loam, and they are mainly slightly acid to neutral. Prader soils consist of mixed material that originated from sandstone, shale, and limestone. They are mainly slightly acid, and they have a surface layer that is generally not so dark brown as that of the Melvin soils. Atkins soils consist of material that originated chiefly from acid sandstone and shale. They are strongly to very strongly acid.

The profiles of these soils are described in the section Descriptions of the Soils.

PLANOSOLS

Planosols are an intrazonal group of soils with eluviated surface horizons (A_2) underlain by B horizons more strongly illuviated, cemented, or compact than those of associated normal soils. They developed on nearly flat upland under grass or forest vegetation in a humid or subhumid climate *(8)*.

In Lawrence County, Planosols are poorly to somewhat poorly drained, and they generally are on more nearly level and somewhat more depressed positions than the associated zonal soils. They are medium to strongly acid. The poorly drained Planosols have a gleyed subsoil and they resemble the Low-Humic Gley soils. However, they differ from Low-Humic Gley soils in having a uniformly small amount of organic matter in the surface soil, a definitely compact pan, and a strong contrast in texture between the surface soil and the pan. The somewhat poorly drained Planosols have some of the color and structural characteristics of Red-Yellow Podzolic soils, and they are therefore thought to be Planosols intergrading toward Red-Yellow Podzolic soils.

Lickdale series

Soils of the Lickdale series have developed from weathered, interbedded, fine-grained sandstone and shale. They are strongly acid and poorly drained. In

C 20 to 36 inches, dark-gray (10YR 4/1) silty clay splotched or mottled with yellowish brown (10YR 5/4); compact and hard.

Robertsville series

Soils of the Robertsville series have developed in old general alluvium derived chiefly from limestone. They are on broad, nearly level areas that are slightly lower than the areas occupied by the associated better drained Monongahela, Tyler, Holston, and Etowah soils on stream terraces. In general, Robertsville soils have the most strongly developed Planosol profile in this group. They are low in supply of organic matter and medium to strongly acid. They probably have a low degree of saturation with bases.

Representative profile of Robertsville silt loam:

A_1 0 to ½ inch, grayish-brown (10YR 5/2) silt loam; large amount of partly decomposed organic matter and leaf mold.

A_2 ½ to 4 inches, gray (10YR 5/1) silt loam mottled with grayish brown (10YR 5/2); friable.

B_2 4 to 16 inches, gray (10YR 6/1) silty clay loam mottled with yellowish brown (10YR 5/6); moderately friable when moist, hard and compact when dry.

C 16 to 36 inches, dark-gray (10YR 4/1) silty clay to clay mottled with yellowish brown (10YR 5/8); heavy and compact; breaks to angular pieces under pressure.

Johnsburg series

Soils of the Johnsburg series have developed from the same type of parent material as the Lickdale and Tilsit soils. Johnsburg soils are on slightly higher positions and have a little more slope than the Lickdale. In addition, they have a little better drainage and have some of the profile characteristics of Red-Yellow Podzolic soils. Johnsburg soils are strongly to very strongly acid, and the degree of saturation of the clay with bases is low.

Representative profile of Johnsburg loam:

A_1 0 to 4 inches, grayish-brown (10YR 5/2) loam; moderately low in organic matter.

A_2 4 to 10 inches, yellowish-brown (10YR 5/4) silt loam.

In this county Lawrence soils are mapped as undifferentiated units with Colbert soils. The pan that is characteristic of the Lawrence soils is not uniformly well developed in the Colbert soils. The heavy clay subsoil and somewhat poor drainage distinguish the Lawrence soils from the Colbert.

Representative profile of Lawrence silt loam:

A_1 0 to 3 inches, dark grayish-brown (10YR 4/2) silt loam; moderate medium crumb or granular structure; very friable; contains a noticeable quantity of very fine sand.

A_2 3 to 8 inches, light yellowish-brown (10YR 6/4) to very pale brown (10YR 7/4) silt

Tyler series

Soils of the Tyler series have formed from about the same type of parent material as the Holston and Monongahela soils. They have a small amount of organic matter and plant nutrients and are strongly acid. The color and structure of the lower subsoil is weakly developed in the Tyler soils. Tyler soils have a moderately well developed fragipan. They occur near the moderately well drained Monongahela soils.

Representative profile of Tyler fine sandy loam:

0 to 3 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak crumb structure.

3 to 9 inches, light yellowish-brown (2.5Y 6/4)

tains partly disintegrated sandstone fragments; weak fine to medium subangular blocky structure; friable.

18 inches +, brownish-yellow fine sandy loam; as depth increases, grades toward loamy fine sand that has little or no structure; partly disintegrated sandstone fragments common; very friable.

Bedrock acid sandstone is at depths ranging from 1 to 2½ feet; in places it outcrops.

Pottsville series

Soils of the Pottsville series have developed from weathered acid shale. They are skeletal soils and have weakly developed profiles. The profile ranges from one that has a thin A_1 and a thin A_2 horizon directly over a matrix of shale fragments and silt to one that has a thin, weak but plainly evident B_2 horizon.

Representative profile of Pottsville shaly silt loam:

0 to 2 inches, dark grayish-brown (10YR 4/2) silt loam to very fine sandy loam; partly decomposed leaf mold, twigs, and fine roots unevenly distributed; friable, very strongly acid; when dry, color is light gray (10R 7/2).

2 to 6 inches, strong-brown (7.5YR 5/6) shaly silty clay; fine to medium blocky structure; friable when moderately moist, sticky and moderately plastic when wet, and hard when dry; very strongly acid; color when dry is reddish yellow (7.5YR 7/6) faintly streaked with yellow and red.

6 to 22 inches, reddish-yellow (7.5YR 6/6) shaly silty clay mottled with yellow, red, and gray; irregular, sharply angular fine to medium blocky

Huntington and Lindside soils are described in the section Descriptions of the Soils. Compared with the other Alluvial soils in the county, these soils generally are browner in the top 10 or 12 inches, have a higher pH value, and contain a better supply of plant nutrients. They also have a somewhat higher percentage of base saturation.

Weakly developed, buried profiles are common in areas of these soils. In these areas the top 6 to 12 inches is brown to dark-brown silt loam with a weak crumb structure. Under this material is a very dark brown layer of silt loam or silty clay loam that has a fairly well-developed subangular structure. This dark, buried layer is from 5 to 12 inches thick, and it appears to have been the surface layer before the uplands were placed in cultivation. It grades to a lighter colored, mottled material. The dark, buried layer is more common to the Lindside series.

In many places, most commonly in the higher parts of bottom lands along large streams, Huntington soils show a slight degree of profile development. In these locations they are a little darker brown to depths of 10 to 20 inches and have some soil structure.

Staser and Hamblen series

Soils of the Staser and Hamblen series differ from those of the Huntington and Lindside series mainly in consisting of mixed alluvium originating from shale, sandstone, and limestone. In addition, they are generally lighter brown and contain more sand. They mainly occupy bottom lands of streams tributary to the Tennessee River. They are medium acid to slightly alkaline.

The Staser and Hamblen soils are described in the section Descriptions of the Soils. Some areas of Ham-

Bruno soils are described in the section Descriptions of the Soils. Their profiles have not developed textural or structural horizonation. However, in most areas a weak color profile has been developed. In these areas the upper 6- to 10-inch layer is darker brown than the underlying material.

Abernathy and Ooltewah series

	Number
Cash grain	10
Cotton	1,970
Dairy	27
Poultry	5
Livestock other than dairy and poultry	121
General	16
Miscellaneous unclassified	1,131

The 1954 United States census classified as cotton less important crops are small grain, peanuts, sorghum for sirup, vegetables, and fruits. The acreage of the principal crops, as reported by the United States census, is given for stated years in table 6.

Cotton is planted on nearly every farm in the county. The cotton acreage has not changed much over the years, but the average yield per acre has increased steadily. The use of large quantities of fertilizer,

Annual lespedeza is widely grown because it is suited to many soils. It will produce hay on soils that are too infertile for the more exacting legumes and grasses. Practically all hay harvested in the county is fed to livestock on the farms where it is grown.

Farmers getting better yields improve the quality of their hay by planting more alfalfa. This plant requires well-drained soils that are moderately high in cotton, winter legumes, and corn is used on many farms on Little Mountain and on some farms in Moulton Valley.

Nitrogen, phosphate, and potash are used for cotton and for corn on uplands. Fertilizer is generally not applied to corn planted on areas that are subject to flooding. Potash, phosphate, and lime are used on hay and pasture, particularly alfalfa. The use of lime has increased greatly in recent years.

Permanent Pasture

The acreage in permanent pasture has increased much in recent years. Most of it is on imperfectly or poorly drained soils. Temporary pastures, which

The chief breeds are Poland China, Duroc, Hampshire, and Ohio Improved Chester White.

Few sheep are on the farms. Southdown and Hampshire breeds are the most common. Lambs and wool are sold to local or nearby markets.

Poultry and eggs are produced on practically every farm for home use. A few farms specialize in poultry and egg production. White Leghorn, Plymouth Rock, New Hampshire Red, and Rhode Island Red are the most common breeds.

Glossary

[Definitions in this glossary were taken mainly from Soils and

Impervious. Very resistant to penetration by water

RAPID: A large proportion of the precipitation profile is wet for a small but significant part of the time.

WELL DRAINED: Water is removed from the soil readily, but not rapidly. A well-drained soil has good drainage.

SOMEWHAT EXCESSIVELY DRAINED: Water is removed from the soil rapidly so that only a relatively small part is available to plants. Only a narrow range of crops can be grown on these soils, and yields are usually low without irrigation.

EXCESSIVELY DRAINED: Water is removed from the soil very rapidly. Excessively drained soils commonly are shallow to bedrock and may be steep, very porous, or both. Enough precipitation commonly is lost from these soils to make them unsuitable for ordinary crop production.

Erosion. The wearing away of the land surface by detachment and transport of soils and rock materials through the action of moving water, wind, and other geological agents. The erosion classification used is as follows: Slightly eroded, moderately eroded, severely eroded, and gullied land.

Slightly eroded. Such soil may have lost as much as 25 percent of the original surface soil, but the plow layer consists almost entirely of material of the original surface soil. Soils, the names of which include no erosion term, are within this class of erosion.

Moderately eroded. Soil eroded to the extent that the subsoil material is within plow depth over about half or more of the delineated area. Ordinary tillage will bring part of the upper subsoil to the surface and alter the original surface soil with an admixture of subsoil material. About 25 to 75 percent of the original surface soil may have been lost. There may be some shallow gullies. The term "eroded" in soil names designates this class of erosion.

Severely eroded. Soil eroded to the extent that all or practically all of the original surface soil has been lost. Tillage is almost entirely in subsoil material. Short shallow gullies are common, and a few gullies may be too deep to be obliter-

Genesis, soil. Mode of origin of the soil, referring particularly to the processes responsible for the development of the solum, or true soil, from the unconsolidated parent material.

Granular. Soil structure in which the individual grains are grouped into spherical aggregates with indistinct sides. Highly porous granules are commonly called crumbs. A well-granulated soil has the best structure for most ordinary crops.

Great soil group. Any one of several broad groups of soils with fundamental characteristics in common. Examples are Rendzina, Red-Yellow Podzolic, and Lithosol.

Green-manure crop. Any crop grown and plowed under for the purpose of improving the soil, especially by the addition of organic matter.

Horizon, soil. A layer of soil, approximately parallel to the soil surface, that has characteristics produced by soil-forming processes.

Horizon A. The upper layer of the soil mass, from which material has been removed by percolating water; the eluviated part of the solum; the surface soil. It is generally divided into two or more sub-horizons; A_0, which is not a part of the mineral soil, but the accumulations of organic debris on the surface; and the other sub-horizons designated as A_1, A_2, and so on.

Horizon B. The layer of deposition, to which materials have been added by percolating water; the illuviated part of the solum; the subsoil. This horizon may be divided into several sub-horizons, depending on color, structure, consistence, or the character of the material deposited, and designated as B_1, B_2, B_3, and so on.

Horizon C. The layer of partly weathered material underlying the B horizon; the substratum; usually part of the parent material.

Horizon D. Any stratum underlying the C, or the B if no C is present, which is unlike C, or unlike the material from which the solum has been formed.

Leaching, soil. The removal of materials in solution by percolating water.

Massive. Large uniform masses of cohesive soil, sometimes with ill-defined and irregular cleavage, as in some of the fine-textured alluvial soils; structure-

Nutrients, plant. The elements taken in by the plant, essential to its growth, and used by it in elaboration of its food and tissue. These include nitrogen

the part of the upper profile usually stirred by plowing.

Terrace (Geologic). An old alluvial plain, usually